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INDIA RUBBER WORLD

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Volume 96 **New York, September 1, 1937** **Number 6**

Compounding for High Speed Vulcanization of Rubber

K. B. Cary[1]

BECAUSE of the possibilities for cost reduction there is keen interest in high-speed vulcanization and certain commercial products—notably insulated wire and rubber thread—are now being advantageously vulcanized by a continuous process at high temperature in specially designed equipment.

LAST April Kemp and Ingmanson gave a paper before the Rubber Division of the American Chemical Society meeting at Chapel Hill, N. C., where they discussed the rapid vulcanization of rubber compounds at relatively high temperatures and presented comparative data on the rate of vulcanization of soft rubber in direct steam at temperatures ranging from 142° to 198° C. (40-200 pounds, steam pressure), and on the quality of the product vulcanized under these conditions. Their paper has since been published in the July, 1937, number of *Industrial & Engineering Chemistry*.

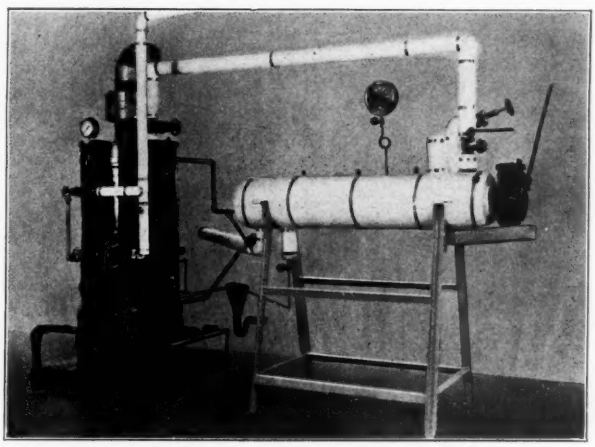


Fig. 1. High Pressure Vulcanizer

Kemp and Ingmanson worked with lengths of wire insulated with various compounds; these were vulcanized in a special high pressure cylinder designed by them. The tubular strips of rubber insulation after removal from the conductors were used as test-pieces, all of which were of substantially the same gage. Besides giving interesting information on the speed of vulcanization at high temperatures the work of these authors has shown the physical quality and aging properties of compounds vulcanized at 170° to 198° C. to be essentially the same as those of the same compounds cured at 142° C.

The heat conductivity of practical rubber compounds is extremely low and because of this the minimum time required for vulcanization is limited in the case of thick articles regardless of the temperature and acceleration used. Also the choice of acceleration is somewhat limited as the ideal accelerator must show no activity at processing temperatures and be extremely active at high temperature. In addition, the accelerator must possess an extremely long curing range since the time necessary for heat to penetrate as little as one quarter inch of rubber at temperatures in the range of 200° C. may be as much as ten times that necessary to completely cure the surface.

The data given in the present article were obtained in the Vanderbilt Laboratory by means of a vulcanizing equipment (Figure 1) similar to that of Kemp and Ingmanson. This type of equipment has been described in

[1] R. T. Vanderbilt Co., Inc., 230 Park Avenue, New York, N. Y.

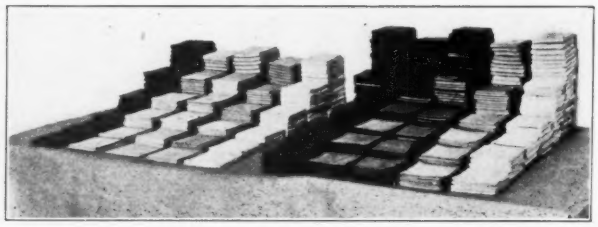


Fig. 2. Uncured Rubber Slabs

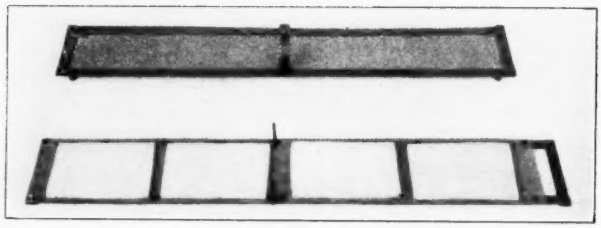


Fig. 3. Curing Rack for Slabs

detail by these authors in their paper. It is essentially a jacketed high pressure steam vulcanizer, the interior being about five inches in diameter and five feet in length, equipped with a quick opening and closing high pressure valve at each end, and having suitable temperature and pressure controls and indicators.

The purpose of the Vanderbilt work was primarily to develop a series of commercial compounds suitable for high speed continuous cure operation, and secondly to present as much data as possible concerning their behavior throughout a wide range of curing conditions in steam. The conditions under which vulcanization was carried out were as follows:

Range of Thickness of Samples	Range of Vulcanization Temperatures
.025 inch	135° C. (30 lbs. steam)
.050 "	148 " (50 " ")
.075 "	170 " (100 " ")
.125 "	186 " (150 " ")
.250 "	198 " (200 " ")
.500 "	

The data given should enable one using these compounds to determine readily the correct time of cure for any temperature up to 198° C. at any thickness up to 0.500 gage.

Compounds for High-Speed Work

One of the difficulties encountered in the continuous process of commercial vulcanization is the development of compounds suitable for the process. Since the time available for vulcanization may be extremely short at high speed operation, the compounds must be fast enough to vulcanize completely in a few seconds in moderately thin gages. In addition they must be capable of being mixed extruded or otherwise processed without setting up. These qualifications can not be obtained with any ordinary accelerator combination, consequently the five different types of compound shown in this article represent a considerable amount of compounding research. These compounds A, B, C, D, and E are considered well suited for commercial high-speed continuous extrusion and vulcanization.

Compound Formulas

	A	B	C	D	E
Smoked Sheet.....	60	100	100	100	100
Whole Tire Reclaim	80	...	...	...	...
Hard Hydrocarbon	80	...	...	...	...
Reogen	..	1	1	1	1
Stearic Acid	0.75	0.75	0.75	0.75	0.5
Agerite Resin D..	1.5	2	2	2	...
Agerite Alba	..	...	...	...	0.75
Zinc Oxide	4	15	15	15	12.5
Gilders Whiting ..	75	125	125	125	25
Dixie Clay	60	20	20	20	50
Kalite No. 1.....	25	25	25	25	25
Rayox	..	...	...	...	20
Litharge	4	3	3	...	...
Sulphur	2.5	3	0.75	...	1.25
Super-Sulphur No. 2	8	12	16	...	...
Altax	..	...	...	...	1.5
Captax	..	...	...	...	1.5
Zimate	..	...	...	...	0.3
Tuads	..	...	...	3	...
Vandex	..	...	...	0.125	...
Telloy	..	...	...	0.5	...
Total.....	400.75	306.75	308.50	292.375	239.30

Scorch Test in Press at 2½ Pounds, Steam (140° C.)

Time of Heating					
10 Min.	Uncured	Uncured	Uncured	Uncured	Uncured
20 "	"	"	"	Slight cure	Slight cure
30 "	"	"	"	"	"
45 "	"	"	"	"	Cured
60 "	"	Slight cure	Slight cure	Cured	"
75 "	Slight cure	"	"	"	"

Typical Physical Properties

Stress at 200%...	500	550	550	550	800
Tensile strength..	800	1500	1300	1500	2200
% Elong. at break	350	450	450	450	475

Compound A is a low-cost stock containing reclaimed and mineral rubber. The curing is done with Super-Sulphur No. 2, litharge and normal sulphur. The stock is not at all sensitive to precuring and can be handled very easily.

This compound is suitable for steam and press cures where tensiles of 1,000 pounds or less are satisfactory.

Compound B is a higher grade stock containing no reclaim or mineral rubber, but more heavily loaded with mineral ingredients. It is also cured with Super-Sulphur No. 2, litharge and normal sulphur. Sensitivity to precuring is quite low, being only slightly greater than that of A. Compound B is suitable for purposes where tensiles of about 1,500 pounds are satisfactory in steam cured or molded goods.

Compound C is similar to B in all respects except that it is based on low sulphur. Sensitivity to precuring is low. The stock is suitable for the same purposes as B, but is superaging.

Compound D is a typical sulphurless, age and heat resistant stock cured with Tuads and Telloy. A small proportion of Vandex is used to bring the rate of cure up to that needed for continuous operation. The compound is suitable for the same purposes as B and C, but where exceptionally good aging is desirable. It is particularly suitable for thick articles.

Compound E is designed for white or light colored products which would be discolored by A, B, or C. It is the fastest of the five compounds at low temperatures, but can be processed readily with proper precautions. The compound is suitable for purposes where tensiles of 2,000 pounds are required.

During this work it was found that combinations of Super-Sulphur No. 2 (diluted lead dimethyldithiocarbamate and litharge (Compounds A, B, C) are particularly well adapted for this kind of compounding. For white or light colored stocks a non-discoloring accelerator combination must be used, such as Captax-Altax with a considerable proportion of Zimate and rather low sulphur as in Compound E.

In the case of sulphurless, Tuads-cured stocks the usual 3% of Tuads is not fast enough. This must be reinforced or boosted by some suitable means. A small amount of Vandex as shown in Compound D gives satisfactory results.

All of these stocks can be handled readily. A, B, C are not at all scorchy at processing temperatures; D and E

are somewhat more sensitive but have been handled commercially with no difficulty.

Preparation of Samples and Test-Pieces

A 50-pound batch of each compound was made in the ordinary way on a 40-inch mill. Sheets were then calendered on a laboratory calender to gages up to and including .125-inch. Higher gages were obtained by plying up the .125 gage stock. Slabs of approximately four inches by five inches (Figure 2) were cut from the sheets and cured in the tubular high temperature vulcanizer. Since the sudden rush of steam into and out of the vulcanizer frequently displaces or distorts such samples, these were placed in a specially designed rack in which they were kept in position by perforated aluminum frames (Figure 3). Slabs of all five compounds of the same gage were cured together. The moment the vulcanizer was opened the slabs were withdrawn and dropped into cold water to arrest the rapid curing.

In preparing the test-specimens, these were died out of the flat slabs in the usual manner for gages up to and including .125-inch. In the cases of the heavier gages samples were buffed on both sides to about .100-inch gage and test specimens were then died out. The standard .250-inch die was used. The object here was to determine the state of cure in the center of the thicker specimens. The condition of the surface of these specimens was determined by prolonging the cure on thinner specimens to the time necessary to thoroughly cure the thick specimens.

Each compound was given a range of cures for each gage and each temperature, designed as far as possible to include under- and overcures. Tensile tests, including modulus at 200% and ultimate elongation, were made on a Scott Tester before and after accelerated aging.

The accelerated aging tests were those commonly applied to commercial stocks of the types shown, and were as follows:

Compound A	48 hours oxygen bomb (70° C. and 300 lbs.)
Compound B, C, D	96 hours oxygen bomb (70° C. and 300 lbs.) 96 hours oven at 70° C.
Compound E	96 hours oxygen bomb (70° C. and 300 lbs.)

Discussion of Results

The vulcanization of slabs of rubber in open steam, and their subsequent testing, involve difficulties which usually tend to produce somewhat erratic figures so that it is practically impossible to get that uniformity and clearness in physical test results which can be obtained from press cures. For these reasons estimation of the exact times required to effect optimum cures under the various curing conditions was quite difficult; hence no attempt was made to do this, but instead the times required to effect good cures were recorded.

The large volume of data has been condensed and shown graphically in Charts 1, 2, 3, 4 and 5. Each chart shows in a general way the time required to produce a good cure in the corresponding compound under various conditions of temperature and thickness and enables one to determine roughly the curing time necessary at 30, 50, 100, 150 and 200 pounds, steam pressure for gages up to .5-inch.

It will be noted that the curve at 30 pounds, steam pressure of Compound D (Chart 4) indicates a slower curing rate than might be predicted from the scorching tests at 2½ pounds, steam. Evidently such scorch tests can not be correlated with curing behavior at 30 pounds, steam.

Several of the slabs of Compound A cured for longer periods at the higher temperatures were found to be quite porous. This was probably due to the effect of the very high temperature on the mineral rubber. There was no

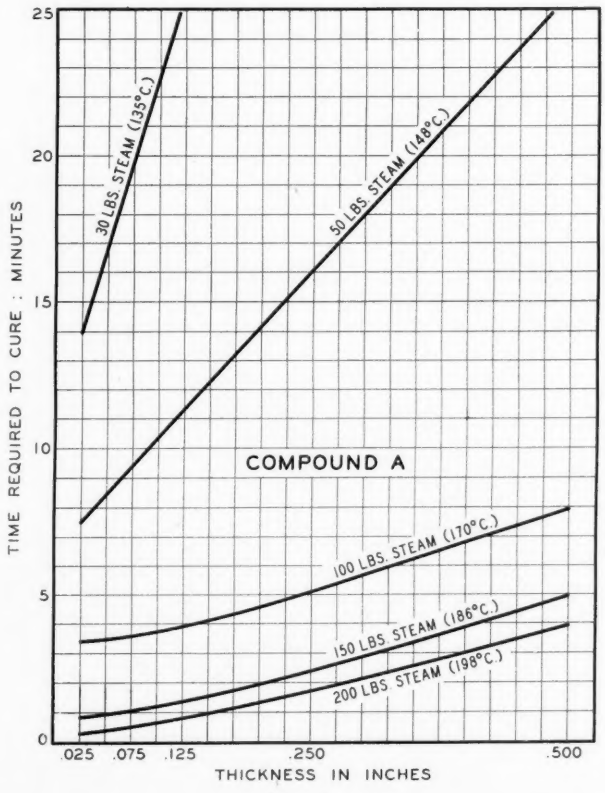


Chart 1

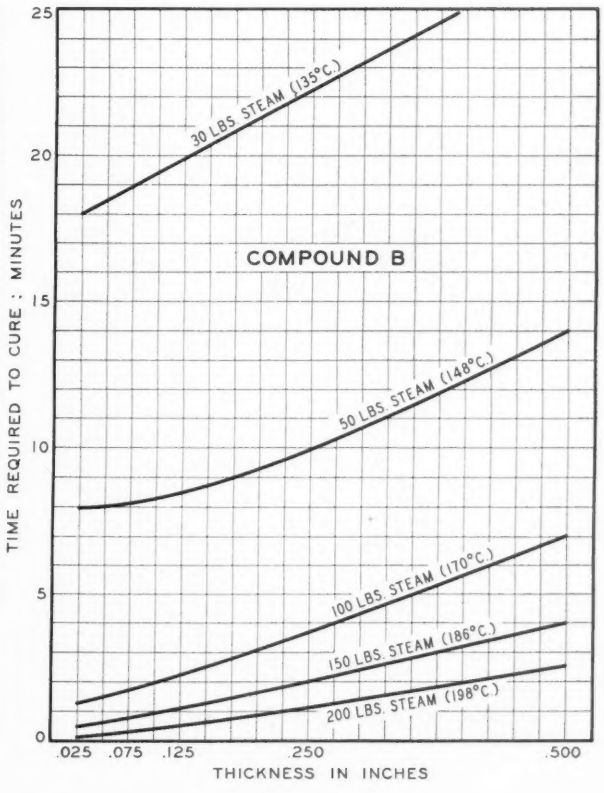


Chart 2

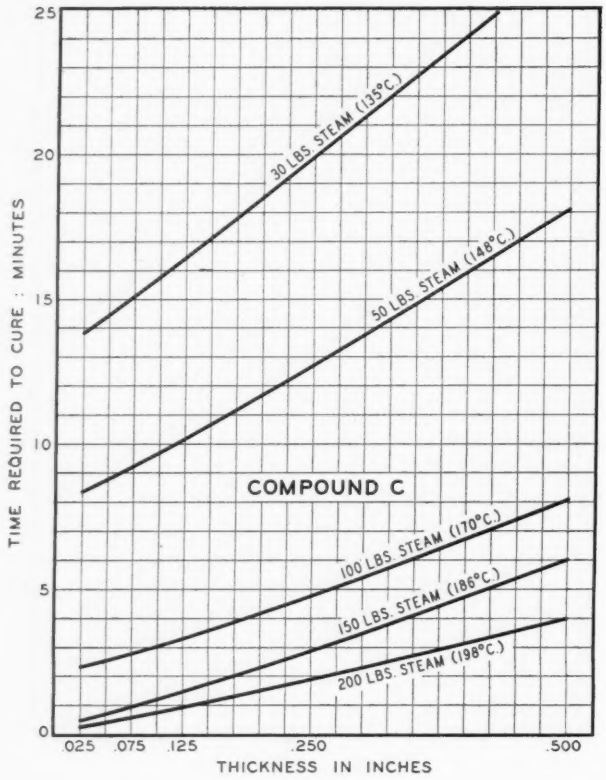


Chart 3

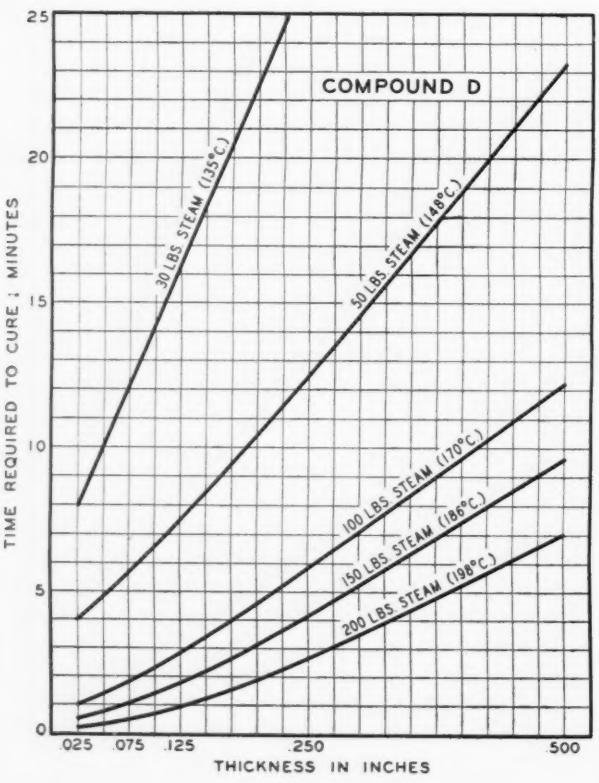


Chart 4

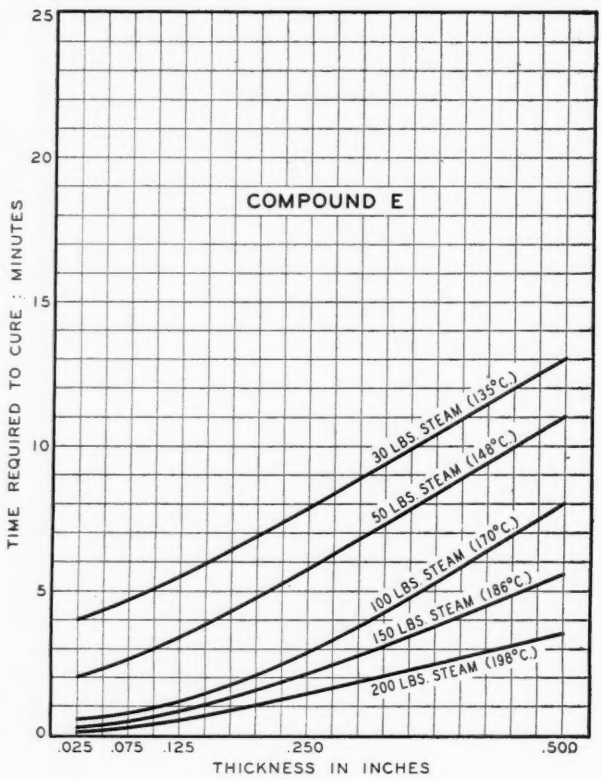


Chart 5

porosity in the short time cures.

Effect of Specimen Thickness. As was to be expected, increasing gage requires longer curing time at all temperatures. However, at gages less than about .075-inch and at the lower curing temperatures (30-50 pounds, steam) the differences in curing time due to gage are small compared with the total curing time. As the temperature increases, the curing time diminishes rapidly, and differences due to gage become more significant. At 200 pounds, steam (198° C.) gage becomes very important so that it is essential that compounds run uniform in gage in commercial practice. The results at low gages and high temperatures indicate that doubling the thickness means approximately doubling the time of cure. The charts show in general the relation of gage to time of cure at different temperatures.

Effect of Temperature. Rate of cure increases very rapidly with increasing temperature, so rapidly that at 198° C. the curing time for the thinner specimens is measured in seconds instead of minutes. The times shown in the charts have not been corrected either for temperature lag or for the few seconds used in introducing and removing the specimens.

Quality and Aging of High Temperature Cures. Physical tests before and after artificial aging indicate that the physical quality of samples cured at the higher temperatures is just as good as of those cured at the lower temperatures. The aging data shown in Chart 6 bears this out and confirm the findings of Kemp and Ingmanson.

The graphs in Chart 6 show the results of tensile tests, made before and after aging, on .050-inch gage specimens. Duplicate samples of each of the five compounds were cured in open steam at 30 pounds and at 200 pounds, steam pressure. The time of vulcanization was mea-

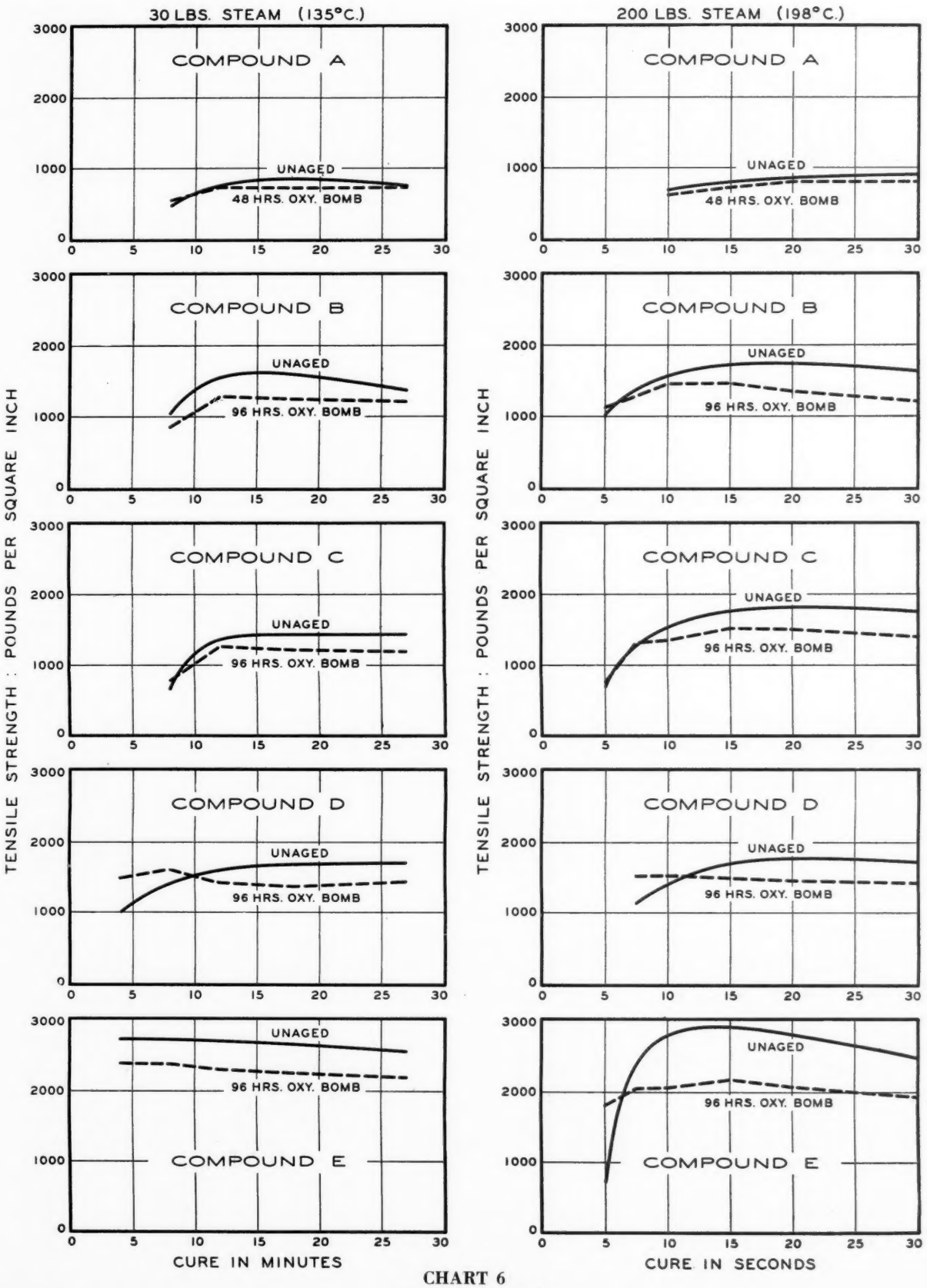


CHART 6

SPECIMENS 0.50 GAGE

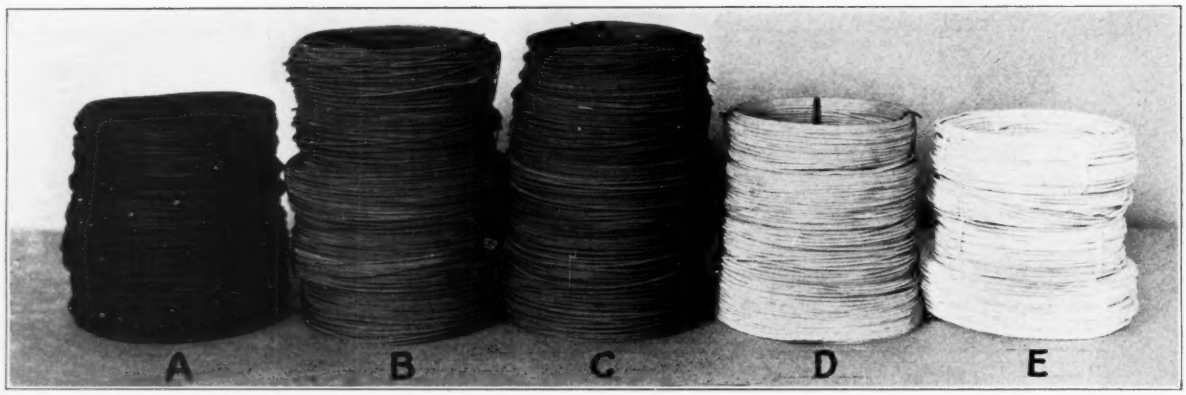


Fig. 4. Vulcanized Wire

sured in minutes for 30 pound cures and in seconds in the instance of 200 pound cures. The bomb aging tests extended for 48 hours in the case of Compound A and for 96 hours on all other compounds.

Commercial Application

High speed vulcanization has been employed by the wire industry for several years in the continuous vulcanization of rubber insulated telephone wire and other types of wires and cables. In this process the rubber compound is extruded on wire into a vulcanizing chamber containing steam commonly held at slightly over 200 pounds per sq. in. pressure. The chamber is in most cases 100 ft. long and equipped with suitable valves so that the process is continuous. The relation between the time of optimum cure in the laboratory apparatus and the speed of operation in the factory may be expressed by the following equation.

$$\text{Speed in ft. per min.} = \frac{60 \times 100}{\text{time of selected cure in sec.}}$$

From the laboratory data on the five given compounds and using the above formula, speeds up to 800 ft. per minute in factory production would be predicted on the .025-inch thickness. For comparison a factory run was made using No. 14 solid (.064-inch diam.) wire with .050-inch insulation of each compound. Speeds from 200 to 700 ft. per minute were used. Higher speeds were not attempted, but the data shown in the charts indicate that this was about the maximum speed practical with this thickness. The factory run showed good conformity with laboratory work.

Figure 4 shows coils of continuous cure wire obtained in factory production from the five high-speed compounds.

Continuous extrusion and vulcanization is only one commercial application of high speed vulcanization. It is conceivable that continuous or semi-continuous processes for calendered and molded articles might be worked out with cures effected in very short times—possibly in one minute or less.

Conclusions

The five compounds shown are very suitable for commercial high-speed vulcanization. While they may be applied to other products, they were especially designed for wire insulation; A being suitable for code wire, B, C and D for various types of 30% insulation, and E for 40% cable jacket.

Factory production runs show these compounds to fulfil all the requirements of curing rate and processability necessary in stocks for continuous process vulcanization.

At 200 pounds steam pressure (198° C.) when run in the continuous curing equipment these compounds will cure well in from 7.5 to 30 seconds for gages of from .025-inch to .075-inch. This means that running speeds up to 800 feet per minute can be obtained with a 100-foot curing chamber. A longer curing chamber permits higher running speed and increases production accordingly.

The aging of insulation applied in this way is apparently just as good as that obtained by the older method of curing insulated wire.

1936 a Record Year for Carbon Black

THE carbon black industry in the United States had a record-breaking year in 1936, establishing new highs for production, domestic sales, and exports, according to the Bureau of Mines. Production totaled 411,345,000 pounds, an 8% gain over the peak in 1930, and 17% more than 352,749,000 pounds for 1935.

Demand totaled 467,736,000 pounds, a 21% gain over the previous peak of 1935. Stocks at plants were reduced materially, reaching approximate working levels at the year-end. Stocks reported on hand December 31, 1936, were only 79,582,000 pounds, the lowest since 1928, when 50,240,000 pounds were reported.

During 1936, 283,421,000,000 cubic feet of natural gas were burned at carbon black plants, against 241,589,000,000 cubic feet in 1935.

Sales of carbon black by manufacturers to brokers and consumers rose from 387,536,000 pounds in 1935 to 467,736,000 pounds in 1936; of the latter 313,018,000 pounds, 67%, were sold in the United States and 154,718,000 pounds, 33%, exported. Of the domestic sales 278,018,000 pounds, 89%, went to rubber companies; 17,787,000 pounds, 6%, to ink companies; 6,914,000 pounds, 2%, to paint companies; and 10,299,000 pounds, 3%, to firms making miscellaneous products.

Carbon black exports reached 154,718,398 pounds against 142,184,802 pounds in 1935 and 152,286,178 pounds, the previous peak of 1933. The United Kingdom continued the leading customer; while France and Germany again exchanged rank, in second and third places, respectively. The total value of exports in 1936 was $7,250,704, compared with $6,673,016 in 1935.

Dispersers and Softeners[1]

J. Behre

THE following article concludes the very informative and interesting discussion on dispersers and softeners that was begun in our August issue.

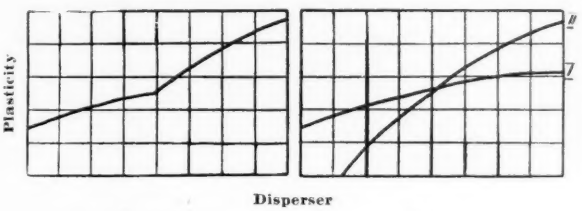


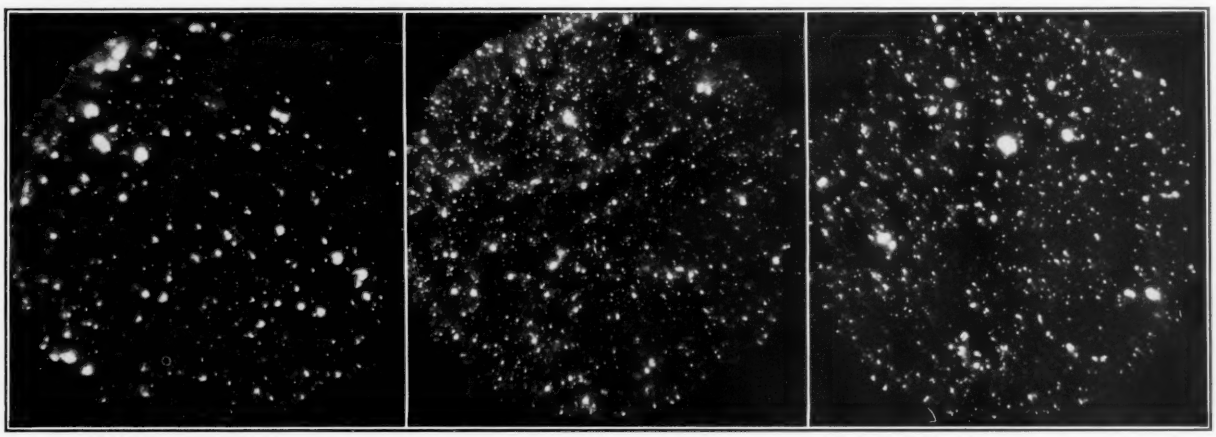
Fig. 15 Fig. 16

Observations

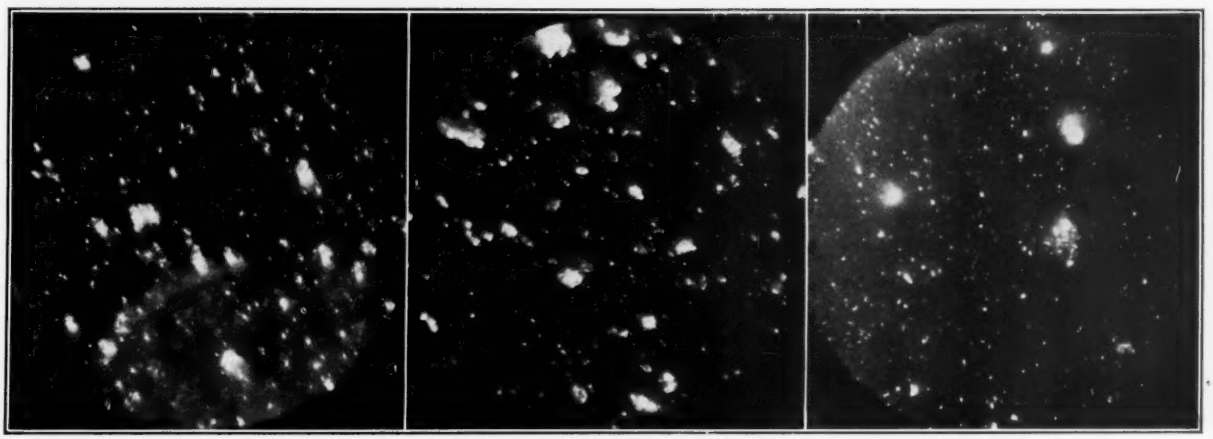
When we study all the numerical data and particularly the graphs, it is at once noticeable that in the cases of the loaded mixes sudden jumps occur in the plasticity curves at definite dosages of dispersers. In plotting the curves, I have purposely refrained from any attempt to smooth them out, plotting only the values found in order to get the numerical picture without any theoretical assumptions. On attempting to analyze the results, one may start from the following consideration.

Let Figure 15 represent diagrammatically the course of the curves. This can be visualized as being made up of two curves, as shown in Figure 16. Curve I, starting from a positive plasticity value and gradually rising, represents the mobility between the rubber particles and the filler particles, which mobility is improved by the addition of dispersers, presumably because the disperser forms a film between the rubber and filler (particles) and thus acts as a lubricant. Curve II, which starts from a

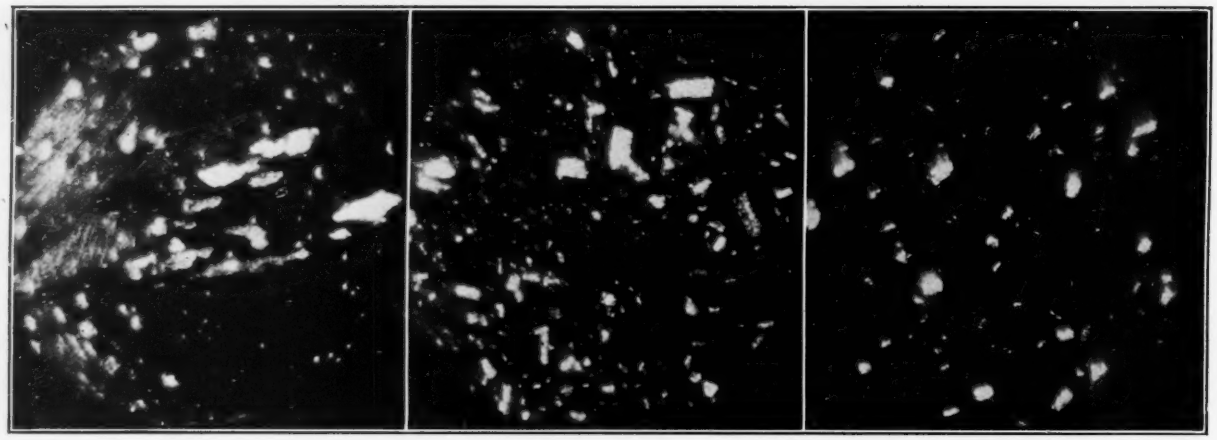
[1] *Kautschuk*, Apr., 1937, pp. 49-60.



700 Crepe, 700 Dixie Clay | **700 Crepe, 700 Dixie Clay, 33.6 Rubberine-Gel** | **700 Crepe, 700 Dixie Clay, 33.6 Stearic Acid**



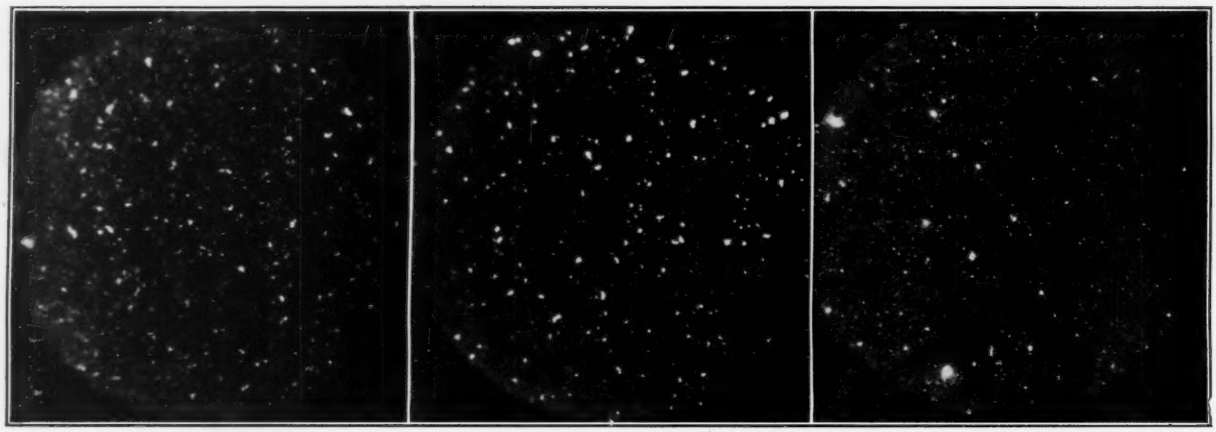
700 Crepe, 1,568 Whiting | **700 Crepe, 1,568 Whiting, 89.6 Rubberine-Gel** | **700 Crepe, 1,568 Whiting, 89.6 Stearic Acid**



700 Crepe, 616 Magnesium Carbonate

700 Crepe, 616 Magnesium Carbonate, 33.6 Rubberine-Gel

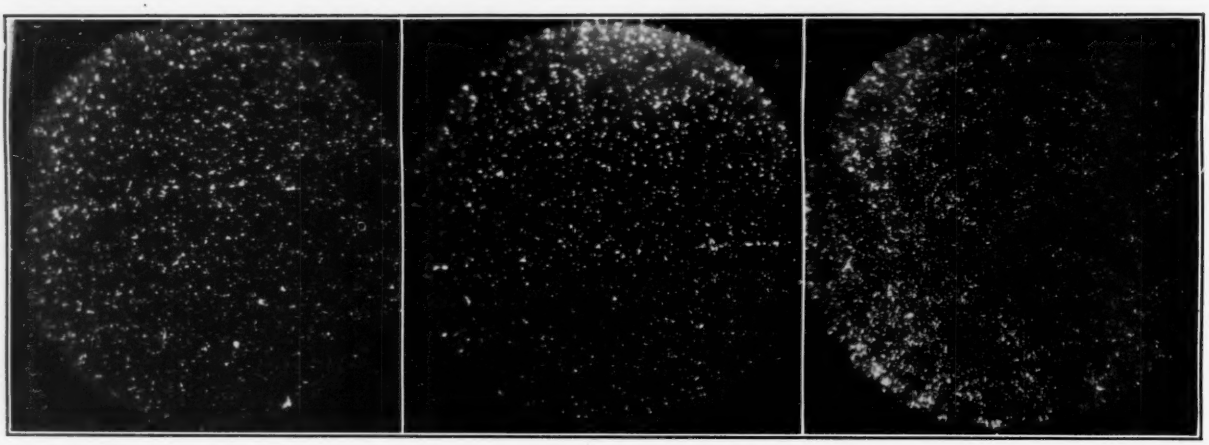
700 Crepe, 616 Magnesium Carbonate, 33.6 Stearic Acid



700 Crepe, 252 Arrow Carbon Black

700 Crepe, 252 Arrow Carbon Black, 22.4 Rubberine-Gel

700 Crepe, 252 Arrow Carbon Black, 22.4 Stearic Acid



700 Crepe, 252 P-33 Carbon Black

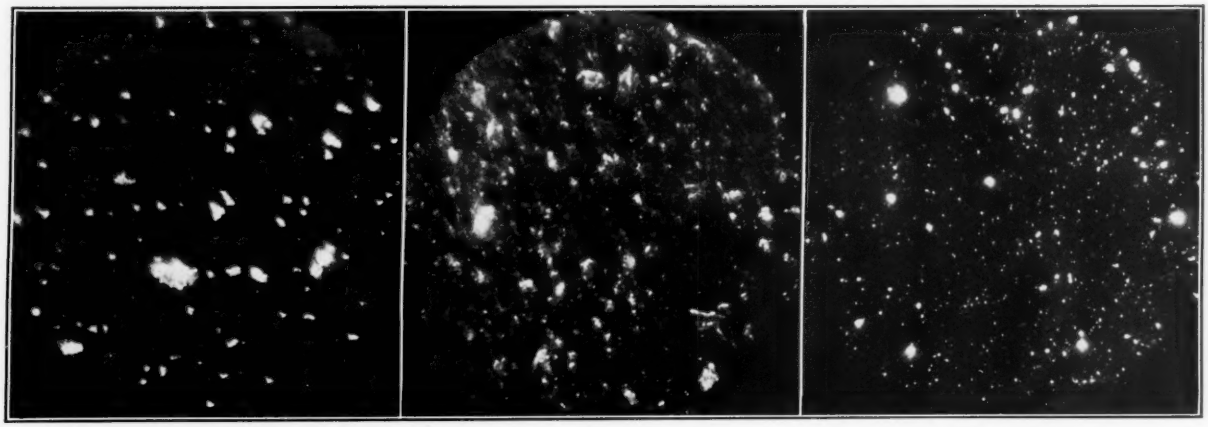
700 Crepe, 252 P-33 Carbon Black, 22.4 Rubberine-Gel

700 Crepe, 252 P-33 Carbon Black, 22.4 Stearic Acid

positive value on the addition axis and ascends more steeply than Curve I, is due to the breaking up of the secondary filler particles into primary particles by the action of the disperser.

That this particle dispersion actually takes place is shown by several photomicrographs made from the above described mixes. The micrographs were made by the method of Allen,[2] that is by squeezing small sections of the mixes between cover glass and slide and setting with beeswax. The photographs were made with a vertical camera, Standard II of Zeiss, magnification 550, dark field.

[2] R. P. Allen, *Ind. Eng. Chem.* (*Anal. Ed.*), 2, 311 (1930).



700 Crepe, 616 Magnesium Carbonate, 33.6 Pine Tar

700 Crepe, 784 Whiting, 33.6 Rubberine-Gel

700 Crepe, 700 Dixie Clay, 56 Rubberine-Gel

700 Crepe, 252 German Lamp Black

700 Crepe, 252 Arrow Carbon Black, 22.4 Pine Tar

700 Crepe, 252 P-33 Carbon Black, 22.4 Pine Tar

On studying the photographs, particularly striking is the difference in shape and particle size of the different fillers. At the same time one can see the far-reaching dispersion of secondary particles in the mixes containing disperser. This is particularly evident in the Dixie Clay and magnesium carbonate mixes, and as we have seen from the curves, these are the very mixes which show the greatest increase in plasticity values. It should be noted that the mix (magnesium carbonate without disperser) was photographed at a magnification of 92 × because the particles were too large for the 550 ×. Finally it should be pointed out that even mixes with high disperser content (for example, 700 Dixie Clay + 56 Rubberine-Gel) still contain secondary particles, from which one may realize how far the rubber industry still is from perfectly homogeneous mixing.

700 Crepe, 252 German Lamp Black, 22.4 Rubberine-Gel

If we now return to a study of the curves, we will observe that, quite independently of the filler, the change in direction occurs at about 10 to 12 volume per cent of disperser (Calc. on the filler). It is true that it does not appear with every disperser, and also the magnitude of the increase varies; nevertheless it is quite commonly recognizable. It seems to me too early to offer a theory in explanation of these curious facts, but I believe that the views of Zsigmondy,[3] on the peptization of inorganic colloids might be fruitful here. I shall revert to this more in detail in the future when more numerical data are available.

Conclusions

Should the practical rubber man now ask what conclusions he may draw from these investigations and which dispersers he should use in the development of his mixes, no offhand recommendation of any one of the materials could be made. As already mentioned, there are numerous factors to be considered in commercial practice. Thus, for example, a disperser is expected to facilitate the incorporation of fillers, to give high plasticity, and not to bloom from either cured or uncured mixes. Frequently the odor or color is objec-

(*Continued on page* 57)

[3] R. Zsigmondy, "Kolloidchemie," 1920, p. 122 et. seq.

Precision Process Control

RECENT progress in developing high temperature processes for rubber milling and vulcanization has stimulated an interest in highly sensitive and accurate automatic temperature and pressure controllers. Instrument manfacturers, anticipating the need for precision controllers, have designed instruments well qualified to meet these new processing demands.

An outstanding example of the rubber manufacturer's response to these new developments is the installation at the Ohio Rubber Co., where all of their presses, more than two hundred, are equipped with control instruments, manufactured by Taylor Instrument Cos. The usual installation is a Fulscope Indicating Controller for controlling the steam pressure in the platens and a two-pen recording thermometer which records the temperatures of the top and bottom platens.

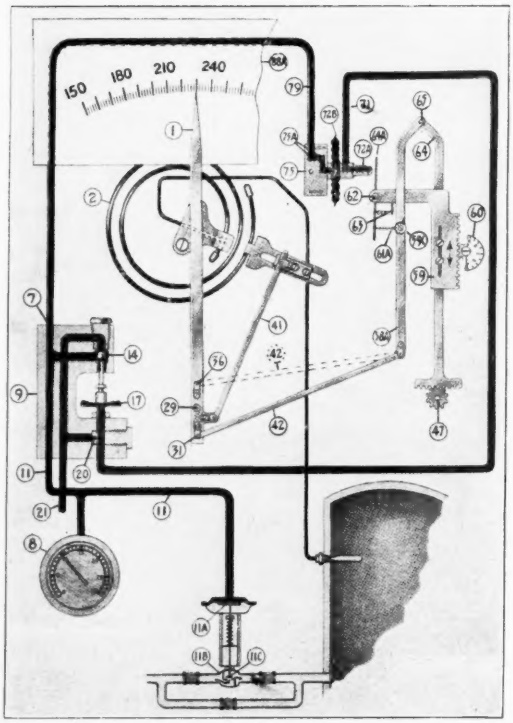
Because of this growing interest a presentation of the design and operating details of a typical controller is given. The instrument described is the Taylor full sensitivity temperature controller. The "sensitivity" is the movement of the indicating pointer which will cause the control valve to change from a fully opened to a fully closed position. Close control is obtainable only when the controller is perfectly adjusted to the time lag of the process. The full range type of controller, having a sensitivity range of 0.14 to 100% of the scale range, can be applied to any type of temperature control. Thus, this instrument is adaptable to short time lags as encountered in steam vulcanizer or platen press control and large lags as found in calender or mill roll temperature adjustments.

Let us assume that the controlling medium is steam, and that both control mechanism and diaphragm valve are direct acting. Also, that the time lag and heat capacity of the apparatus require the controller to be adjusted for low range sensitivity.

In the schematic diagram it will be noted that nozzle 72A is carried on bellows 72B, and the nozzle block and pressure tap 7 are connected by pipe 79 which is at the operating pressure. Thus, when the instrument is adjusted for low range sensitivity a groove on the under side of plate 75 connects ports 75A so that the same pressure variations are applied to bellows 72B as are applied to diaphragm motor 11A.

When the temperature is throttling at the control point (230° F.) as shown, the air supply (25 pounds pressure), which enters the relay air valve 9 through pipe 21, bleeds through orifice 20 into pipe 71 which is at 0 pounds pressure and partially escapes through the larger orifice in nozzle 72A. The rate at which the air escapes through nozzle 72A is controlled by the clearance between it and baffle 64A which, in turn, is determined by the relative positions of control lever 58A and adjusting lever 64; in other words, by the relation of the indicating pointer to the control point.

So long as the control point is maintained, the escape of air through the orifice in nozzle 72A is at a constant rate.



Schematic Drawing of Full Range Controller

Bellows 17 remains correspondingly deflated and air-valve ball 14 is supported in some mid-position which throttles the flow of compressed air from pipe 21 into pipes 11 and 79. Thus, with a given inflation of the diaphragm motor, the valve disc 11C is held in a fixed position and throttles the flow of steam to the apparatus.

Any tendency of the apparatus temperature to rise above the control point would cause Bourdon spring 2 to uncoil proportionately, and its clockwise movement would be transmitted through link 41 to pointer 1 (which rotates about pivot 29) and by link 42 to control lever 58A. Pin 61A, which is attached to lever 58A, and held in contact with the lower end of baffle 64A by spring 63, then would move the upper end of the pivoted baffle farther away from nozzle 72A. This would increase the escape of air through the orifice in the nozzle which, in turn, would further deflate bellows 17 and lower air-valve ball 14, proportionately increasing the output air pressure through pipes 11 and 79.

While the increased pressure on the motor diaphragm 11A is forcing the valve disc 11C downward and reducing the flow of steam to the apparatus, the same increase in air pressure is further inflating sensitivity-reducing bellows 72B so that the nozzle 72A follows the travel of baffle 64A. Thus, for the same change in temperature, the escape of air through nozzle 72A and the change in position of valve disc 11C would be less than when adjusted for a higher sensitivity. Assuming the controller sensitivity is perfectly adjusted to the time lag of the process, the resulting decrease in steam input would be just as fast as the apparatus could absorb it without overshooting the control point.

An instrument of similar design is available for the many

(*Continued on page* 57)

BECAUSE of the increasing tendency toward the use of compounded latex in the manufacture of rubber products and because of the numerous granted patents involving the use of compounding of latex, the judge's decision will be published in full in these columns. Owing to the length of the decision and its substantiating presentation the article in this issue will include (1) a statement of suit, (2) finding of facts pursuant to Equity Rule 70½, (3) discussion of plaintiff's motion to reopen, and (4) conclusions of law. The October issue of INDIA RUBBER WORLD will present verbatim the discussion, as included in the decision, of the three patents in question, namely: Gibbons; Hopkinson; Foster and Cook. EDITOR'S NOTE.

Latex Patents Declared Not Infringed

DISTRICT COURT OF THE UNITED STATES
DISTRICT OF CONNECTICUT

In Equity
No. 2454

UNITED STATES RUBBER CO.
v.
SIDNEY BLUMENTHAL & CO., INC.

Clifford, Scull and Burgess, Esqs., of New York, N. Y., Solicitors for Plaintiffs: (Newton A. Burgess, Esq., and Henry M. Leigh, Esq., both of New York, N. Y., of counsel);

David L. Daggett, Esq., of New Haven, Conn., Solicitor for Defendant; (E. Clarkson Seward, Esq., and W. Saxton Seward, Esq., both of New York, N. Y., of counsel).

This is a suit for the infringement of three patents: namely, Gibbons, No. 1,654,167, issued on December 27, 1927, upon an application filed December 17, 1923; Hopkinson, No. 1,784,523, issued December 9, 1930, upon an application filed June 21, 1924; Foster and Cook, No. 1,816,574, issued on July 28, 1931, upon an application filed March 7, 1929. The usual defenses of invalidity and non-infringement have been interposed. And in addition the defendant has pleaded a defect of parties-plaintiff.

Finding of Facts Pursuant to Equity Rule 70½

1. The parties have entered into a comprehensive stipulation of facts which was marked in evidence as "Exhibit 8." This is hereby made a part of this finding.

2. To supplement Paragraphs 1 and 6 of said stipulation, I further find as follows, viz.: That by its answer (Par. 15) and amended answer (Par. 15), the defendant pleaded a defect of parties-plaintiff; that prior to the trial the plaintiff filed no motion for argument upon said objection pursuant to Equity Rule 43; that at the beginning of the trial the defendant pressed its said objection, whereupon in answer to plaintiff's inquiry as to whether it might then be heard upon the subject, the court suggested that "We wait until we get some proofs in the record;" that thereafter throughout the trial neither party pressed the court for any ruling upon the subject-matter, or was any motion addressed to the subject-matter made or filed by either party at the close of the trial, but the objection was renewed by the defendant upon its briefs.

3. The plaintiff's chemical expert witness, who had served the plaintiff not only as a research chemist, but also as a sales manager and sales promotion manager, was allowed without objection by the defendant and without any offer of the plaintiff's sales or financial records, to state his conclusion that the "three inventions of these patents in suit have been used together in the manufacture of pile fabrics by the (plaintiff's) licensees to the extent of something over fifty million square yards in the past few years." Neither party offered in evidence any specimens of the commercial product of the plaintiff or its licensees. Or was other evidence offered tending to show that such commercial success as plaintiff's products had attained was attributable to patentable invention inherent in any one or more of the three patents in suit.

4. I further find that the representations set forth in Paragraph 2 of the stipulation with reference to the defendant's normal commercial operations were in fact true; that its operations were in fact as therein set forth; and that the only coating materials used by the defendant in the processes and articles charged to infringe consisted of the vultices specified in said Paragraph 2(b). These vultices were purchased by the defendant ready-made, fully prepared, in condition for immediate application.

5. By agreement between the parties on March 15, 1937, there was filed a plaintiff's motion to reopen this case to permit of the introduction of excerpts of testimony given by the defendant's expert in equity suits Nos. 4023 and 4281, brought by the Vultex Corp. of America against Heveatex Corp. in the United States District Court for the District of Massachusetts, a case decided by Judge Brewster by opinion dated April 23, 1937. On the same day an answer to said motion was filed by the defendant and a reply thereto by the plaintiff. Said motion is pending awaiting decision.

6. The plaintiff's case on the issue of infringement was based upon the conclusions of its expert and his conclusions, at least with respect to the alleged infringement of Gibbons, were in turn based upon tests made by another chemist in plaintiff's employ upon samples of the vultices used by the defendant. These tests were what were known in the art as (a) the T-50 test; (b) the free sulphur test; and (c) the combined sulphur test. All three of these tests were made (1) upon films of crude rubber obtained by plaintiff's witness by drying the vultices used by the defendant at room temperature (Transcript, page 60), and (2) upon completely dried

samples of the defendant's product taken at its successive stages through the defendant's process. None of these tests were adapted or adequate to show whether or not said samples, both those made by plaintiff's witnesses from the vultices and those taken from the defendant's products, had acquired any vulcanization whatever after the first treatment or first application of the liquid vultices and prior to the time that the vultices had become coagulated or dried. At a later stage in the trial, to be sure, a chemist in plaintiff's employ, when called by the plaintiff, testified that he had made a so-called chloroform test. The test, however, was without significance for the witness stated that in each case the resulting coagulation failed to indicate whether the coagula were vulcanized or not. If and in so far as any of the samples tested by the plaintiff were found to be vulcanized, for aught contained in the entire record such vulcanization may have occurred possibly *before* the vultices were applied or indeed sold to the defendant (as the defendant has throughout contended) or in any event *after* the coagulation or drying of the vultices was completed. Thus, referring specifically to the step in defendant's process described in the stipulation of facts Paragraph 2(f) and (g), there is no evidence to show how much of the eight minutes required for the step was required to coagulate or dry the product. For aught that appears the product may have been coagulated or dried in, say, three minutes and any vulcanization thereafter disclosed by test may have taken place only in a dried or coagulated latex during the remaining five minutes of the step, or indeed during the time intervening prior to the making of the test.

With Particular Reference to Gibbons

7. The plaintiff offered as a witness the patentee, a research chemist long in the employ of the plaintiff, who testified that he had conducted a series of experiments in 1919 and 1920 and interpreted his contemporaneous record of said experiments in a note book which was itself received in evidence. There was nothing in the note book, however, or indeed in the testimony of the patentee to show the consummation of an experiment wherein vulcanization was actually accomplished prior to coagulation or drying, nor at a temperature less than 240° F., which plaintiff's own expert indicated was the low limit of temperatures "ordinarily employed in hot vulcanization methods." To be sure, on page 65 of the note book, under date of September 13, 1919, is shown a latex compound containing a high powered accelerator, but the entry shows neither that the compound was vulcanized prior to drying nor that in that instance the compound was in fact dried and vulcanized at all. Instead, it was noted that the compound was abandoned in preference for "a different latex compound which would not vulcanize at, say 212°—thus enabling it to dry at 212°."

8. Curtis, a research colleague of Gibbons in the employ of the plaintiff which maintained a single patent service for use by all its research employes, in 1926 obtained a patent, U. S. No. 1,605,649, upon an application dated July 17, 1923, wherein he disclosed a process for proofing haircloth in all respects similar to the Gibbons process except that in Curtis it was disclosed that the vulcanizing followed drying. See page 1, line 102.

Schidrowitz, U. S. No. 1,156,184 (1915) disclosed the production of a dried and vulcanized rubber product by mixing vulcanizing ingredients, including "accelerating agents," with latex "either before or during the incipient stage of coagulation" and thereafter vulcanizing while the coagulum was still wet. He contemplated broadly the use in the mixture of "accelerating agents, or any one or more of the ingredients ordinarily employed in rubber mixings." He further contemplated the use of some such material as ammonium carbonate for its gassing effect which was desired for the spongy product which was his objective. The expert evidence is in conflict as to whether ammonium carbonate was an organic high-powered accelerator under the terminology of the art as of the effective date of Gibbons. (In view of the conclusions which I have in mind presently to state, it is unnecessary to solve this conflict.) I do find, however, that this reference contains no disclosure of low temperature vulcanization.

Bruni, Italian No. 173,322, issued on September 9, 1919, on an application valid as from March 15, 1919, and Italian No. 173,364, issued October 4, 1919, upon an application also valid as from March 15, 1919, discloses a process for the vulcanization of "rubber, or of objects made of natural or synthetic gum elastic (rubber), of any nature whatever by the application of organic, high-powered accelerators capable of vulcanizing at temperatures" as low as the "ordinary ambient temperature" or "in a much shorter time than that usually taken," or "at temperatures which are much lower than those customarily employed for vulcanization in the hot, for instance, temperatures below 100°" (meaning 100° C.).

With Particular Reference to Hopkinson

9. As long ago as 1791, Peal (British 1,801) conceived a process for water-proofing "hide, skin, leather, cloth, silk" by a brush-given "regular thin coating" of rubber dissolved in turpentine or oils. Hancock, British No. 5,122 (1825) after a naïve description of Hevea latex and the process of its "inspissation" discloses a process for its application to "fibrous substances" which are "saturated or coated," followed by a drying. As early as 1863 the application of a concentrated latex was disclosed. Siemons, British No. 464. In 1868 the use in the United States of natural latex for waterproofing fabric was disclosed by Bishop, U. S. No. 73,288. Morisse Publication "Le Latex" in 1909 taught that a concentrated latex would not penetrate, but that penetration makes for adhesion. Milne, British No. 24,680 of 1914, disclosed an uncoagulated concentrated latex mixture. Britton, British No. 184,578, of 1922, disclosed a process for the preparation of rubberized materials which consists in applying a stabilized, thickened latex to the material, followed by drying and vulcanization. See also McGavack, U. S. No. 1,523,821, filed July 11, 1923.

With Particular Reference to Foster and Cook

10. Both the Gibbons and the Hopkinson patents in suit were offered as references against Foster and Cook.

The defendant also offered Crabtree, U. S. No. 2,007,078, issued upon an application dated August 10, 1926. This reference discloses an article comprising (1) a pile fabric (2) upon the back of which has been applied a cementitious binding material to anchor the V's of the piles to the ground of the fabric. And on page 2, line 18, it is said: "The coating compound may consist of a solution of pyroxylin and vegetable oil, or in other cases may be a rubber composition or any other viscous fluid of a cementitious nature capable of adhering to the back of the fabric and hardening thereon." The specification discloses that the usual method of application was by a "doctor blade" for pyroxylin and by calendering for a rubber compound. It is further stated, page 2, line 65, "that various modifications may be made in . . . the composition of the material used as a coating, and in the method of applying the coating."

Discussion on Plaintiff's Motion to Reopen

The views expressed above are not at all dependent

upon the subject-matter of this motion. The substance of the motion being thus immaterial, on that account alone it should be denied. But even if the case turned upon the testimonial weight to be accorded to the defendant's expert, I should still feel constrained to deny the motion. For brief excerpts of testimony torn from their context in another case dealing with issues not disclosed, may not safely be used for purposes of impeachment. To be sure, impeachment is a proper function of cross-examination. But the right of cross examination is a right qualified by the correlative right of redirect examination. Were I to grant the motion at this stage, the effect would be to allow an extension of the cross-examination while denying the correlative right of redirect examination.

I come, therefore, to the following

Conclusions of Law

1. That no earlier date has been proved for the Gibbons patent in suit than the date of its application.

2. That, quite independent of the foregoing conclusion, the Gibbons patent in suit must be construed as limited to a process wherein the drying and vulcanization of the compounded latex proceed simultaneously and thus construed has not been shown to have been infringed.

3. That the Hopkinson patent in suit, with respect to all of the claims at issue, is invalid for want of patentable invention.

4. That the Foster & Cook patent in suit, with respect to all of the claims at issue, is invalid for want of patentable invention.

5. That the Plaintiff's motion to reopen must be denied.

6. That in view of the conclusions above stated, there is no need to determine the validity of Gibbons or whether or not if Hopkinson and Foster & Cook were held to have any validity, infringement thereof has been proved, or whether or not there is a fatal defect of parties-plaintiff.

A decree may be submitted dismissing the bill, with costs to the defendant.

Dated at New Haven this 10th day of August, 1937.

CARROLL C. HINCKS,
United States District Judge.

(To be continued)

Chilled Rubber[1]

CRUDE rubber becomes hard at low temperatures, exhibiting most of the phenomena associated with true crystallization; for instance, a development of well-marked birefringent granules, a decrease in volume during freezing, and an incipient formation of crystal nuclei before contraction in volume begins. When a strip of crude rubber is stretched moderately, nailed to a board, cooled to –25° C., and maintained at that temperature, it first becomes hard and then during a few hours the length of the stretched piece increases about 4%. This secondary elongation is roughly independent of the amount of stretch if the increase in length has been between 20 and 300%. This has been observed with smoked sheet, pale crepe, milled pale crepe, and smoked sheet swelled slightly by benzene to remove strains, and thoroughly dried. It is absent or feeble with vulcanized rubber, with rubber stretched to a marked degree, or with unstretched rubber. The effect is not simply a component of the volume changes which occur on stretching or freezing, but is opposite in direction and has at least four times the magnitude which such volume changes would produce. By analogy with the contraction of stretched rubber on heating, it seems probable that this phenomenon is related to the Gough-Joule effect and that the increase in length is accompanied by a lateral contraction of such magnitude that the volume decreases.

Available evidence indicates that rubber hydrocarbon consists of very long molecules. Upon stretching they tend to be oriented parallel to the direction of elongation so that, when freezing begins, a crystalline axis has already been established. The crystals are correspondingly oriented. During freezing a time comes when enough molecules have fallen into crystalline spacing to harden the sample and relieve the stresses that produced stretching. As more molecules moved into the crystalline arrangement, the spacings at right angles to the stretch become less, the long directions of the molecules become more strictly parallel to the axis of stretch, and the sample is elongated.

[1] Abstracted from a paper by W. H. Smith and C. P. Saylor, of the National Bureau of Standards, in *Science*, Feb. 19, 1937, pp. 204-205.

Rubber-Asphalt Roads[1]

UNDER the auspices of the Rubber Growers' Association, British investigations have been in progress during recent years. A small area of roadway was surfaced two years ago with a special rubber-asphalt mixture, and this experimental section has shown that the introduction of relatively small proportions of rubber reduces the tendency of the bitumen to come to the surface under the action of traffic. In this way a relatively fine texture, and non-skid surface is obtained which will remain unaltered over a considerable period.

The success achieved with the small section warranted the surfacing of a larger area, and approximately 4,500 square yards have recently been laid. This road, which consists of a consolidated gravel base, runs approximately due north and south, varies slightly in gradient, and ranges from 24 to 28 feet in width. It carries approximately 6,000 tons of traffic per day.

Seven different sections of rubber-asphalt have been laid, all composed of a specially graded ¼-inch dust igneous rock aggregate coated with a special asphaltic cement, with the addition of varying proportions and types of rubber in the form of latex or crumb. A section of a similar mixture, but without rubber, was also laid for comparative purposes. All the mixtures were laid to a thickness of approximately ½- to ¾-inch and rolled when warm with a 3-ton roller. The technique of mixing and laying was almost identical to that employed for a similar type of rolled asphalt without rubber.

Except for a small section where the base was weak, reports indicate that the material rolled well, and traffic was allowed over the finished surface as soon as rolling was completed. The finished surface possessed an even sandpaper texture which appeared adequately non-skid. The behavior of this roadway under modern traffic conditions is being watched with considerable interest.

The Technical Research and Development of New Uses Committee of the R.G.A. has entrusted this work to the London Advisory Committee for Rubber Research (Ceylon and Malaya), collaborating with the Limmer & Trinidad Lake Asphalt Co., Ltd., and the Poole Corp.

[1] Abstracted from *Bull. Rubber Growers' Assocn.*, June, 1937, pp 291-92.

Preservation of Latex by Acids[1]

Edgar Rhodes and K. C. Sekar[2]

THE authors describe the results of some purely empirical attempts to preserve field latex by the simple addition of acid. The common knowledge of the process of coagulation and published researches thereon do not encourage the view that acids might be used to maintain field latex in a fluid condition over long periods. Fullerton[3] in coagulation experiments found that when latex containing 20% by weight of rubber is treated with progressively increasing amounts of acid, the second liquid zone—which with latex containing 4% of dry rubber occurs between the pH values 3·52 and 1·00—is barely, if at all apparent. With undiluted field latex containing 35% dry rubber this second liquid zone is entirely absent; between the pH values 4·49 and 0·83, which represent amounts of added acid corresponding to 2 c.c. and 30 c.c. of N. HCl per 100 c.c. latex, coagulation is either complete or almost complete and no zone of complete dispersion is found. From these experiments it would appear very unlikely that by the addition of any acid to field latex fluidity could be maintained. The results obtained in some such experiments with large amounts of acid are described below.

Acetic Acid

Experiments were first made with latex diluted to a dry rubber content of 15%. In Fullerton's experiments with such latex the greatest amount of acetic acid applied was 8 c.c. of the 2·5% acid or roughly ⅛ c.c. of the pure substance per 100 c.c. of latex. With amounts of acid of this order complete coagulation resulted. In the present experiments it was found that if the amount was increased to 10 c.c.—20 c.c. of pure acid per 100 c.c. latex, no coagulation occurred and fluidity was maintained during an observation period of over three weeks.

When similar experiments were made, however, with latices containing over 30% dry rubber, coagulation or clotting resulted over a wide range of acid concentrations. Nowhere in the range which extended to 25 c.c. of pure acid per 100 c.c. of field latex was a zone of satisfactory fluidity observed.

Formic Acid

With this acid fluidity zones were found both for diluted and undiluted field latex. It was found that with latex diluted to a dry rubber content of 15% a fluid condition was maintained for over six weeks by the addition of amounts of 90% formic acid lying in the zone 5-25 c.c. per 100 c.c. of latex.

With undiluted field latex fluidity was maintained for the same period on treatment with 7-25 c.c. of 90% acid per 100 c.c. latex. The fluidity zone appeared, however, to be narrower with some latex samples than with others. In certain cases the upper limit beyond which coagulation occurred either immediately or in less than three days was found to be 15 c.c. of acid per 100 c.c. of latex. The amount giving the best general results was the equivalent of 10 c.c. of 90% acid per 100 c.c. latex. Samples of field latex preserved with this amount of acid were found after six weeks' storage to have no putrefactive odor; the latex also passed through a sieve having 100 meshes per inch without leaving measurable clots. There was, however, a noticeable lack of stability; when heavy frothing was induced by vigorous agitation, the froth coagulated. Similarly, rapid stirring quickly induced coagulation in the body of the latex. After approximately eight weeks' storage in glass, a clear yellow serum began to appear in the lower layers of latex; shaking restored homogeneity, but partial separation occurred again in approximately one week's time. This indicated almost beyond doubt that the acid preserved latex was in a micro-flocculated condition, which would account in great measure for its comparative instability. It was found that the stability of the latex could be improved slightly by the addition of 1% of saponin calculated on the rubber phase of the latex. Curiously enough casein had little if any stabilizing effect. The saponin "stabilized" latex, although less sensitive to added compounding solids such as sulphur and zinc oxide than the parent unstabilized acid latex, was nevertheless decidedly unstable.

Technical officers of the London Advisory Committee for Rubber Research examined four-gallon samples after shipment to London and found that with the simple formic acid latex, an appreciable amount of clotting took place on the walls of the containers during transit, and that in the case of the saponin stabilized latex the amount of clotting was almost negligible.

Other Acids

Preliminary trials with abnormally large amounts of hydrochloric, nitric, and tri-chloracetic acids on undiluted field latex have so far not resulted in the finding of zones of permanent fluidity for latices treated with them.

Discussion and Summary

It is shown that by the application to field latex of amounts of formic acid of the order of 9% by weight on the latex, or 10% by volume of the 90% commercial acid, a product results which will retain its fluidity for long periods. It is, however, micro-flocculated and unstable. Because of their instability it seems unlikely that acid latices of this kind will find technical applications. The findings are in no way contradictory to those of Fullerton, whose experiments on coagulation did not include trials with such large amounts of acid.

Acknowledgment

The authors' grateful thanks are due to G. Martin and W. S. Davey for the examination of the latex samples in the laboratories of the London Advisory Committee for Rubber Research (Ceylon and Malaya).

[1] Abstracted from *Bull. Rubber Growers' Assocn.*, June, 1937, pp. 286-88.
[2] The Rubber Research Institute of Malaya.
[3] R. G. Fullerton, *Q.J.R.R.I.M.*, 2, 156 (1930-1931).

Saturation of Absorbent Papers with Rubber Latex[1]

M. J. Vittengl[2]

HERE we are concerning ourselves with what to a layman would seem to be a perfectly easy task: namely, the rubberization of fibrous webs through the medium of rubber latex. Quite simple—merely a two-component system with paper-making fibers as the predominant constituent and rubber as the sub-dominant member, or as might be stated in other words, fiber as the continuous phase and rubber as the disperse phase. This has been the cause of many heartaches in the past and even today is a potential pitfall for the unwary experimenter who would rush into the production stage without adequate development background. It is my purpose to enumerate some of the salient angles to this partnership between fiber and rubber latex.

That the combination may be considered in the light of paper-making fibers as the dominant factor and rubber as the sub-dominant factor is true only as to the physical extent to which these constituents are present in commercial products today—which products range from 60 to 85% in fiber constituents and 40 to 15% in rubber. Aside from this quantity consideration, rubber plays the important role and causes practically all of the difficulties.

Particle Composition of Latex

Latex is a milky liquid which consists of extremely small discrete particles of rubber suspended or dispersed in an aqueous medium. The microscope even at low magnification shows that we are dealing not with a homogeneous true solution, but with a dispersion. The individual particles are in constant Brownian movement, and the particle size is not uniform. These two facts are extremely important when we come to the application of rubber latex in the impregnating operation.

The actual size of the particles in *Hevea* latex varies between 0.5 - 3.0 mu. (1 mu. = 0.000,039,4-inch) on the minor axis and 4 to 5 mu. along the major axis. From this you will deduce that the latex particle is not spherical but on the contrary it is usually pear shaped.

The number of such particles present in a small volume of latex is enormous. Henri, an early investigator, has determined that in latex of 8.7% concentration 1 cc. contains 50,000,000 particles. In 35% normal latex we would find 201,150,000 particles per cc. or 200 billion per litre.

Process Obstacles

In short the rubberizing of fibers with latex involves the ushering of 200 billion unruly particles per litre in an orderly manner to their proper places in the interstices of a paper web and insuring that they stay in their proper places. In addition to this there are the problems with which every rubberizer is familiar, but which paper technologists often fail to consider with consequent sad results: namely, protection against oxidization and decomposition. Rubber latex has a tendency to be affected by oxygen in the air and thereby to be changed to a brittle resinous state of matter. Naturally this condition is not satisfactory where flexibility is paramount; hence this tendency must be overcome in the utilization of rubber latex. Certain metals, notably copper and manganese, exercise a very deleterious effect on the rubber particles, causing them to lose their nerve or elastic strength and to reduce them first to a tacky condition and then to a stiff brittle state. Therefore these metals must be rigorously avoided in all machine parts, and naturally they cannot be tolerated in paper webs which are to be saturated.

History of Processes

It is apparent that the conception of using rubber latex in forming paper-making fibers into sheets is not new, but it must be pointed out that early attempts to use latex in this operation were very crude and did not approach the results obtained within recent years. This advance has been due to improvements in paper-making technique and in methods of handling, compounding, and applying latex.

The use of latex in treating paper-making fibers dates back to Hancock's patent[3] in which he treats fibers such as flax, hemp, cotton, and the like by placing them in layers upon a smooth inclined surface and then saturating the fibers with latex in this position. A further patent[4] embraces a process for treating rags and other fibrous materials with latex after they have been beaten to form a pulp or slurry.

Dry Web Saturation

Aside from these patent activities little practical work was done with latex in connection with paper in the early 1800's, and the first commercial application of rubber to paper was made by saturating dry paper with gasoline solutions of rubber. The use of latex was discouraged because of its scarcity and the resultant high cost of the small amounts available. By 1850, however, it was found possible to stabilize rubber latex by the addition of ammonia and thus allow shipment of the latex without the fear of spoilage en route. With the advent of rubber latex in commercial quantities it was natural that it should be applied to the problem of saturating paper and we find a British patent issued to Hancock in 1864 and a United States patent, No. 73,287, issued to Bishop in 1868 covering the impregnation of paper with rubber latex. More recently we find United States patent No. 1,526,984 issued to Hopkinson in 1925 covering the same idea.

Beater Application of Latex

Saturating dry paper with rubber saturants was the only method of incorporating rubber into paper until 1924 when a signal advance in the art was made by Kaye who added rubber latex to paper-making fibers in the beater

[1] Paper read at meeting of Delaware Valley Section, Technical Association of the Pulp and Paper Industry, May 21, 1937, Philadelphia, Pa.

[2] Plant manager, Vinton Mills, E. I. du Pont de Nemours & Co., Inc., Brattleboro, Vt.

[3] British patent No. 5,045 dated 1825.

[4] British patent No. 5,970 dated 1830.

and formed the resultant mass into paper in the usual manner on a paper machine. This process is covered by U. S. patent No. 1,500,500, issued to Kaye in 1924.

Wet Web Process

In 1934 the latest step in the application of rubber latex to paper was introduced when United States patent No. 1,966,458 was issued to Novak covering the process of saturating a wet web of paper-making fibers in a continuous fashion in a routine paper-making operation.

Present Commercial Processes

For producing rubberized fibrous products today, three commercial processes are herewith described.

Dry Web Saturation

In the dry sheet saturation process the paper-making fibers are beaten to the desired degree and then formed into paper and dried on a paper-making machine in the usual manner. The resultant paper is subsequently treated with rubber latex to effect rubberization. This saturation is carried on as a separate disassociated operation with the accompanying coagulation and drying in a different location in the same mill or oftentimes in a separate mill.

Beater Application

In the beater process the paper-making fibers are beaten to a certain degree. At this point rubber latex is introduced into the beater and thoroughly mixed with the pulp. A coagulating agent is then added to precipitate the rubber. The resultant rubber treated pulp is then formed into paper and dried on regular paper-making equipment. The paper-making and saturating operations are continuous, being performed in consecutive stages on the same paper-making unit.

Saturation of Wet Web

In the wet web saturation process the paper-making fibers are beaten to the desired extent. The resultant pulp is formed into paper in the usual manner but the wet web issuing from the press rolls, instead of going to the driers, is passed through a bath of latex, and the excess latex is removed from the sheet by squeeze rolls; after which operation the wet, latex-saturated sheet is dried in the usual manner. As in the beater process, this method is continuously completed on the same machine.

Wet Web vs. Dry Saturation

In brief, the advantages of the wet web process over the dry sheet saturation method are: (1) lower labor and operating costs; (2) greater versatility with respect to fibers suitable for treatment; (3) better quality products. A comparison of these two methods is discussed below.

Operating Cost

The obvious outstanding difference between the wet web process and the dry sheet saturation method is that the former consists of a single continuous operation from fiber to saturated paper while the latter is a two-stage discontinuous process with two separate drying operations. The dry sheet saturation involves an extra handling, between the forming and saturating operations, which always result in some damage and loss of paper. Also the wet web method eliminates the cost of all intermediate handling charges entailed by the dry sheet method as well as the cost of the extra drying operation.

Saturability

The wet web process is more versatile in its application to the problem of rubberizing paper than is the dry sheet saturation method. For successful operation of the dry sheet method the paper must be saturable. In this process the saturant must have free access via the interstices of the paper to the interior of the sheet. The size of these interstices determines the speed of infiltration of the saturant, and in the case of suspensions or emulsions it also determines whether the saturating solids will penetrate into the sheet or will be filtered out on the surface. In the case of rubber latex, which is a dispersion of rubber particles in water, a very open structure is necessary to allow infiltration of the rubber particles. This means that the sheet must be porous, and the fiber in turn must be of a definite soft bulky nature. This definitely limits the scope of the utility of this method. It is impossible to saturate a dry sheet of Kraft paper or any other hard fiber with rubber latex. In fact, the only fibers suitable for use in this process are highly refined wood fiber such as Alpha Web, highly curled wood fibers such as Krafelt, and such soft stocks as rag, cotton, digested rope, etc. The inherently saturable fibers are the most expensive, and in order to make saturable the inherently unsaturable fibers, it is necessary to treat them either mechanically or chemically, which operation is also costly. In contrast to the material limitations imposed on the dry sheet saturation method, the wet web process will operate on any fiber irrespective of its inherent characteristics of saturability in the dry state, and thus the hard cheap fibers as well as the soft, more expensive ones can be used. This is due to the fact that saturation is effected while the web is wet and the latex is able to penetrate into the sheet along the watery canals already provided.

Uniformity of Penetration

Finally, even in the case of a saturable fiber, the wet web process will yield a more uniformly latex saturated product than the dry saturation method. In the case of the dry sheet method the saturating solids are progressively concentrated during penetration of the saturant into the sheet, and the result is a product having more rubber in the exterior fibers than in the interior fibers. This phenomenon is due to the rapid absorption of moisture by the dry fibers which tends to concentrate the saturating solids in the first wave of saturant meeting the dry web. This concentrated material has lower mobility or penetrability than the more dilute material behind the initial wave and effectively slows up penetration into the interior of the sheet. In the wet web method, on the other hand, the fibers are already wet with water and do not tend to concentrate the saturant; hence uniform, rapid infiltration of the saturating solids is facilitated, and the resultant product is more uniformly impregnated with rubber.

Wet Web vs. Beater Saturation

While both the wet web method and the beater process are continuous in their nature, the advantages of the former over the latter are threefold: greater rubber efficiency; greater paper efficiency, and less subject to difficulties in operation.

Fiber Concentration

It is a chemical fact that no attraction exists between fiber and wet rubber; consequently the efficiency of any process depends entirely on the probability of fibers entangling the particles of rubber in the latex. In view of this fact the most effective process, from the standpoint of rubber efficiency, is that process in which the concentration of fiber is highest.

Considering the fiber concentration of both processes in the light of this axiom, it is pointed out that in the beater process the latex is added to a slurry of approximately 4% fiber and 96% water; whereas, in the case of the wet web process, the latex is added to a wet sheet

having a composition of approximately 40% fiber and 60% water. Again, in the case of the beater process, after the addition of latex to the beater, the latex-fiber-water slurry is diluted with water to approximately 0.4% solids and 99.6% liquids at the paper machine, and any unattached rubber particles are lost at this point.

Water Solubles

In the beater process, the extreme dilution results in a high loss of the water soluble constituents of the latex whereas in the wet web process no dilution occurs, and all water solubles are left in the sheet. Inasmuch as these water soluble materials contain valuable natural rubber antioxidants, it is desirable to retain them in the sheet.

Rubber Cohesion

The product of the beater process as it emerges from the system is harsh and paperlike, and in order to bring out the rubber characteristics it is necessary to use excessive pressure to cause the discrete rubber particles to cohere. In the wet web process, on the other hand, the product is mellow or rubbery without recourse to this excessive pressing operation. This fact would indicate that the beater process yields a product in which the rubber is present as isolated particles; whereas the wet saturation process yields a product in which the rubber is present as a coherent film.

Formation Efficiency

The next point of advantage of the wet web process over the beater process lies in the field of paper efficiency. In the wet web system the fiber is treated to yield the best possible stock from a paper-making standpoint. This stock is then made into paper in the best paper-making manner, and finally this well-made paper is saturated with latex.

The beater process, on the other hand, represents a compromise between good paper making and optimum rubber efficiency. The beater process militates against good paper making because the presence of the rubber particles tends to keep the fibers separated and thus prevents close felting or interlocking of the fibers. In a good paper the fibers are closely interlocked, and the rubber particles act to prevent this action; hence only mediocre formation or felting is obtained in the finished product. Another point to be considered is that of the fouling characteristics of the rubber upon the screens and felts of the paper machines. To reduce this tendency for the "gumming" of the felts by the rubber the latex may be compounded with agents which reduce the adhesiveness of the rubber particles. This non-adhesive characteristic, however, will persist even in the finished sheet; thus a stock with good running characteristics tends to yield poor rubber utilization.

Possible Spoilage Loss

The final advantage of the wet web process over the beater process lies in the greater "foolproofness" of the former. In the beater process the latex is added to the beater, and if the resultant stock does not yield good paper, the only alternative is to dump the beater to the sewer. In the wet web process, on the other hand, the fiber is made into a good sheet of paper before it is ever led into the saturator. Until the sheet is correct, the wet web is returned as "broke" to the beater, and in this way there is practically no loss due to sheet adjustments.

Conclusion

Of the three processes considered the wet web saturation method appears to be preferable not only from the viewpoint of cost, but also because it lends itself to more efficient operation. In connection with any of the three methods highly technical consideration is necessary to practical, efficient manufacture of a uniform quality product.

Precision Process Control

(*Continued from page* 50)

processes having comparatively small time lags where only high sensitivity is necessary. This instrument is adjustable to any sensitivity valve within the limits of 0.14 to 7% of the scale range. In reference to the diagram, this high sensitivity type differs from the full range instrument in the following manner: pipe 79, plate 75, and bellows 72B are omitted, and pressure tap 7 is closed with a plug. This instrument may be converted into the full range type by replacing these parts.

Dispersers and Softeners

(*Continued from page* 49)

tionable. If we select say three materials—viz., stearic acid, pine tar, and Rubberine-Gel, we see that stearic acid undoubtedly gives high plasticity values; but yet it makes filler incorporation more difficult, and it blooms out easily so that calendering is often rendered difficult. Pine tar likewise has good plasticizing value, but the odor is objectionable and it may discolor bright goods; in carbon black mixes it forms aggregates which stick to the back roll and are hard to incorporate. Rubberine-Gel, which does not have the disadvantages just mentioned and is suitable for bright as well as dark goods, forms non-tacky surfaces very undesirable when joining two surfaces. Therefore it must be decided from one case to another which dispersers should be used or whether or not several should be used simultaneously. Also the amount must be determined by the requirements of the specific problem; with active fillers more will be required, less with inactive materials like whiting, for example, which itself has some plasticizing action. From my own experience the most favorable plasticity for commercial factory work is about 80. This may be obtained in general by additions[4] of 5 to 6% of disperser.

On the other hand if the problem is that of breaking down rubber and thereby saving power in mastication, one should select not dispersers, but rather softeners. As I have shown above, the product Reogen gives quite outstanding results in this field; but German produced rosin oil also has a strong softening effect on rubber and may be used as a substitute for Reogen or for the now extensively used Plastogen, the active plasticizer of which is chemically identical with Reogen, but is less concentrated and consequently does not give such high plasticity values. If about 2% on the rubber is used, that will suffice for most cases.

In this paper I have shown that the differentiation between dispersers and softeners which I have made is really justified and that the dispersive effect of the products is decidedly variable, depending on the filler used in the mixing.

Correction

In the first part of this article, run in August, on page 47 under the heading "Materials" the word in parentheses in the first line should be (RCMA), not (Roma).

[4] J. Behre, *Gummi-Ztg.*, 49, 1299 (1935).

Editorials

Cotton Abundance

THE recent official estimate of cotton production in the United States for the 1937 season prophecies an extremely abundant crop of approximately 15,500,000 bales and is giving rise to agitation for legislation to guarantee that no such bountiful harvest will reoccur next year. Reports indicate that in Texas, which produces approximately one-third of the nation's cotton, it has been necessary to discontinue the payment of relief to workers who have been told to pick cotton. Transportation facilities are overtaxed, and cotton gins are running throughout the night. Because of the bounties of nature there is such a demand for labor as to furnish an opportunity for able persons legitimately to support themselves through the expedient of performing productive work. An estimated 250,000 cotton pickers are reported to be working in the fields of Texas alone.

Yet there is apparently a governmental desire to control the total production next year if necessary in order to maintain a higher price level than will naturally follow an abundant crop. Indications point toward a tendency to establish a more or less arbitrary price and then control the output to guarantee that price as a minimum rather than to produce an abundant supply and then control the price to insure equitable compensation to the grower.

It is reasonable to assume that regardless of the yield per acre, the cost of preparing and growing each acre of cotton is practically the same. If this is true, the additional cost per acre in the case of a bounteous yield over a poor yield would originate only from the operations of harvesting and marketing the excess tonnage. If legitimate average costs per acre for growing and per bale for harvesting and marketing were established, an approximate equitable selling price could be set up so as to compensate the grower for his excess cost per acre and provide him with the same gross profit per acre in the case of a large yield as with an average yield.

Rather than less cotton at higher prices, should not the aim be more cotton at commensurately lower prices? The results of successful attempts in this direction would be fourfold: namely, provision of more employment for more people; tendency toward recapture of that portion of the foreign cotton market which has been decreasing during recent years; creation of greater domestic use of cotton products; and the delivery of cotton materials to the consuming public at a decreased rather than an increased price.

"Years of plenty" and not "years of drought" should be presumed to be beneficial and the general public should be permitted to reap the rewards of a copious crop.

Industrial Development

STAGNATION creates a condition which, unless segregated and overcome, will in many cases develop into a strangling death-grip. National and world growth is vitally dependent upon technical, industrial, and commercial advancement. In turn the forward movement of any industry as a whole is proportional to the availability for coordination of the results of individual accomplishment.

Continued effort by members of an industry is necessary in an attempt to improve machines, raw materials, and processes and to increase the fruits of manual energy so as to redound to the mutual benefits of all concerned. Because of this research expense the fostering companies are certainly entitled to the advantages gained thereby. In many instances when advantages have been well established, information regarding the results and the methods of accomplishment may be disseminated to the industry without materially affecting their importance to the parent organization. Very often a fruitful idea can be obtained from the description of a development in an irrelevant phase of the industry, and beneficial application can be made to another branch of the same industry or even to an unrelated industry.

Practically all companies and individuals desire to obtain information, but a great many do not acknowledge the fact that in order to assure continuous availability of helpful established facts, contributions must be made by the individual members which make up the industry. Few individuals can be successful without recognizing the existence of interdependence. A spirit of cooperation is necessary even though it may be prompted by selfish motives. Data which make possible records for aiding an industry must necessarily be supplied by those who accomplish results.

Distribution of recorded accomplishments which will further the advancement of an industry and the interests of its members can be carried on best through the activities of trade associations and trade publications. Proper coordination between the members and their media for dissemination is necessary to obtain the fullest industrial development and the greatest national leadership. Industry in general and the members individually will be benefited ultimately by a generous interchange of informative descriptions of the results of industrial research.

S. C. Stillwagon

EDITOR

What the Rubber Chemists Are Doing

A. C. S. Rubber Division Activities

Fall Meeting

THE fall meeting of the Rubber Division, American Chemical Society, will be held at the Powers Hotel, Rochester, N. Y., on September 9 and 10, in conjunction with the general program of the society's ninety-fourth meeting.

Rubber Division papers will be presented at sessions from 1:30 to 4:15 p. m. on Thursday, September 9, and from 9 to 11:45 a. m. on Friday, September 10. The business meeting will be held at 11:45 a. m., and the executive committee meeting at 12 noon on Friday. The Rubber Division banquet and entertainment will take place Thursday evening and the committee in charge is arranging the entertainment in a novel form of supplier representation and the usual presentation of favors and prizes will be dispensed with.

The papers committee, with A. R. Kemp as chairman, has selected an excellent group of papers. Six of these will be presented during the Thursday session and five on Friday. Allotted time for each paper is 15 to 30 minutes with short discussions to follow. Abstracts of these papers are given below in the order of presentation, the first six being scheduled on Thursday p. m. and the last five on Friday a. m.

Abstracts

Preparation and Testing of Latex Compounds. A simplified method for obtaining uniform and reproducible physical test data on latex compounds is described. The control of temperature and humidity from the pouring of the films to the ultimate testing of the test strip is necessary to produce these results. J. W. MacKay, Monsanto Chemical Co.

The Protein from Natural Rubber and Its Amino Acid Constituents. The protein constituents of rubber have been extracted from the natural rubber by removal of the rubber hydrocarbon with solvents, followed by electrodialysis of the residue. A material has thus been obtained which contains 57.66% C., 7.54% H., 12.52% N., and 22.28% O., corresponding to a formula $(C_{10}H_{16}N_2O_3)_x$. This material is hydrolyzed by sulphuric acid, and the hydrolysate contains glycine, aspartic acid, leucine, proline, arginine, histidine, lysine and representatives of the group comprising alanine, phenyl alanine, hydroxy-proline and serine, cystine, tyrosine and glutamic acid are absent. T. Midgley, Jr., A. L. Henne, and M. W. Renoll, Department of Chemistry, Ohio, State University.

Ultra Violet Microscopy of Hevea Rubber Latex. Samples of bulk rubber latex received in sealed cans from two sources have been investigated by means of the ultra violet microscope. The advantages of the ultra violet microscope are: (1) an enormous increase in resolving power; (2) selective absorption of the ultra violet light by many substances and (3) the ability to optically section very small objects suited to the purpose. Brief descriptions of the apparatus and technique are given. Artifacts have been minimized in the preparation of the slides. A multitude of particles bordering on colloidal dimensions have been clearly resolved. Particle size measurements including complete tabular data and a particle size distribution curve for each specimen are given. Approximately 90% of the particles are 0.50 micron or less in diameter. The shape of the latex particle appears predominantly spherical, though elongated particles and irregular shaped particles are found. Optical sections in some cases show these to be groups of particles, in others single particles. Some evidence is disclosed that two particles may coalesce to form one. Many of the smaller particles appear to lose their electrical charges and become attached to larger particles. Possible effects of ultra violet radiation are discussed. F. F. Lucas, Bell Telephone Laboratories, Inc.

Composition and Structure of Hevea Latex. Data relating to composition and structure of the latex particles are presented. The number of particles in one gram of 40% latex has been calculated and found to be 47×10^{12} on the basis that they are round and have an average diameter of 0.26 microns as determined by F. F. Lucas.

A study was made of the effect of several factors on the water content of rubber in pressed coagulum from fresh and treated latices. The average value for the water of retention of rubber coagula from fresh latex was found to be about 11% increasing to about 22% in the case of old latex and deproteinized rubber from alkali treated latex. It appears that this water is held mechanically in the colloid hydrocarbon structure of the latex particles.

The particle structure of sheet rubber is discussed and it is suggested that plasticization by milling results in the gel hydrocarbon shell on the rubber particles being converted to sol rubber through the agency of heat in the presence of oxygen. The difference between gel and sol rubber is believed to be mainly one of colloid state since swollen gel in CS_2 is readily dispersed on the addition of propionic acid. A. R. Kemp, Bell Telephone Laboratories, Inc.

Softening Agents in Neoprene. The influence of typical representatives of the common chemical classes of rubber softening agents on the properties of carbon black loaded neoprene has been determined. The properties studied include plasticity, stability and retention of softness of uncured neoprene, and stress-strain properties, hardness and resistance toward solvents of cured neoprene. Certain softening agents have been found to be superior for special uses. H. W. Starkweather and H. W. Walker, E. I. du Pont de Nemours & Co., Inc.

Water Resistance in Neoprene. The contraction in total volume during absorption of water by neoprene compounds containing magnesia is attributed to hydration of the magnesia. Neoprene compounds with a water resistance exceeding that of smoked sheet rubber compounds may be obtained by compounding with litharge and such additional activators as zinc sulfide and catechol. Rosin improves the water resistance of neoprene compounds at elevated temperatures. Sulphur decreases the water resistance of magnesia-zinc oxide and litharge neoprene compounds in proportion to the amount used. The influence of temperature on the water absorption of both magnesia-zinc oxide and litharge compounds has been determined. H. W. Starkweather and H. W. Walker, E. I. du Pont de Nemours & Co., Inc.

A Comparison of the Vulcanizing Characteristics of Smoked Sheets and Latex Rubbers. Latex rubbers markedly affect some accelerators and others little or not at all. Latex rubbers give higher modulus, faster rate of cure and more scorch than smoked sheets. The addition of NaOH to smoked sheets

duplicates the results of latex when mercaptobenzothiazole is employed as the accelerator. Mercaptobenzothiazole, di(benzothiazyl thiol) dimethyl urea, butyraldehyde and butylidene aniline reaction product and diphenyl guanidine are not sufficiently active for commercial use with either latex or smoked sheets rubber at temperatures and times of cure desired by manufacturers of latex products.

Ultra-accelerators at 109° C. (227° F.) give similar results with smoked sheets and latex rubbers. Increasing the amounts of zinc oxide has little or no effect on the curing results. Increasing the amounts of sulphur markedly increased the modulus and tensile results. E. W. Booth and J. W. MacKay, Monsanto Chemical Co.

Electrical Characteristics and Aging Properties of Gutta Percha and Balata. Data is given upon the dielectric resistance, electrification, dielectric constant and loss factor of several groups of natural compositions of the gutta percha class. Curves connecting the variation of some of these properties with time and temperature, and the effect of additions of one component to another, are also included. It is demonstrated that the electrical characteristics of a mixture cannot be predicted from a knowledge of the figures relative to the components. The aging properties and methods by which accurate data may be obtained are stated. The general results are discussed in the light of cable requirements and a plea made for the alteration of cable specifications in the light of the data available. J. N. Dean, Telegraph Construction and Maintenance Co., Ltd.

Sorption of Water by Rubber. The effect of several variables on the rate of sorption of water by rubber is discussed. Expressions based on short-time immersion tests are derived which permit calculation of the water content after any period of immersion under fixed conditions of temperature and vapor pressure. A sorption coefficient by which one material may be compared with another is suggested and its application to practical problems is considered. R. L. Taylor and A. R. Kemp, Bell Telephone Laboratories, Inc.

The Goodrich Flexometer. A new form of hysteresis test has been developed in this laboratory and used for a number of years in the study of heat generation and fatigue of both rubber and rubber-fabric compositions at ordinary and elevated temperatures. It involves applying a definite compressive load to a test piece through a lever system having high inertia, imposing on the sample an additional high-frequency cyclic compression of definite amplitude and measuring with a thermocouple the temperature rise at the base of the test piece. Because of the high inertia and low natural period of the lever system, practically none of the high-frequency vibration is transmitted to the loading lever, although the lever does move to compensate for slow changes in the sample caused by permanent set and other structural changes. The machine may be used to study the effects of the time of cure, the magnitude of the applied load, changes in pigmentation, and variations caused by anisotropy in rubber compounds on the heat generation during flexure. It is so designed that structural changes such as softening or stiffening may be followed during the period of flexure. E. T. Lessig, B. F. Goodrich Co.

The T-50 Test Applied to Zinc Oxide Compounds. The authors have adapted the T-50 test, as described by Gibbons, Gerke and Tingey in 1933, to a study of the curing rate of zinc oxides in rubber compounds. A new method of expressing results obtained in this test is used which condenses the data and renders comparisons relatively easy.

The major variables in zinc oxide, particle size, and chemical purity have been studied with several accelerators and conclusions drawn as to the effectiveness of these variations in zinc oxide on curing rate in both gum stocks and loaded stocks. Data on the reproducibility of the test and the effect of the freezing temperature and of shelf aging are also given. G. S. Haslam and C. A. Klaman, New Jersey Zinc Co.

Boston Group

THE first annual outing of the Boston Group, Rubber Division, A.C.S., was held August 13 at "Fieldston," Marshfield, Mass. Enjoyed by 122 members and guests, and aided by excellent weather, the affair was an outstanding success. The committee proved capable as old timers in its first venture of this type. The outing committee, composed of George W. Smith (chairman), Royce J. Noble, John T. Blake, Ralph B. Huber, and James C. Walton, provided an excellent program of sports, including golf, softball, bowling, and swimming.

The golf tournament, which got under way in the early afternoon, was held at the Marshfield Country Club with 75 golfers taking part. The Boston Group team defeated the Rhode Island Rubber Club two up in the main event. E. M. Ruppert made a low gross score of 83, with J. M. Mason and R. Newell second and third, respectively. A low net of 67 was scored by H. T. Mason, and the longest drive, 245 yards, was made by A. L. Perry. D. Wright and H. Atwater were credited with the highest scores. The winners of the kicker's handicap were: T. Ashley, low handicap division; R. Huber, medium division; and A. W. Ross, low division.

At Fieldston, M. J. Linn acted as official for the softball game, which was an exciting contest between two closely matched teams. Band music and refreshments were furnished during the game. Many enjoyed swimming in the ocean and salt-water pool.

At 6:30 p.m. the group assembled to witness an extraordinary exhibition of rifle and shotgun shooting by W. G. Hill, of the Remington Arms Co.

During an excellent dinner of turkey or swordfish the band furnished music. After the dinner 17 golf prizes were awarded, and a number of door prizes were distributed. The donors of prizes included: Monsanto Chemical Co.; Quabaug Rubber Co.; Wishnick-Tumpeer, Inc.; American Zinc Sales Co.; United Carbon Co.; R. T. Vanderbilt Co.; C. K. Williams & Co.; Titanium Pigment Corp.; The New Jersey Zinc Co.; INDIA RUBBER WORLD; Ansbacher-Siegle Corp.; Godfrey L. Cabot, Inc.; J. M. Huber, Inc.; Vultex Chemical Co.; Binney & Smith Co.; E. I. du Pont de Nemours & Co., Inc.; The Barrett Co.; Henry L. Scott Co.; Hood Rubber Co.; Alfred Hale Rubber Co.; Plymouth Rubber Co.; B. C. Ames Co.; Cambridge Rubber Co.; Boston Woven Hose & Rubber Co.; Colonial Beacon Oil Co.; Halowax Corp.; Hodgman Rubber Co., Inc.; Pequanoc Rubber Co.; D. H. Litter Co.; and Davidson Rubber Co.

Following the distribution of prizes, Frank Sullivan, chief photographer of the Boston Police Department, pre-

sented an interesting group of stills depicting crime and accidents.

Moving pictures and stills taken during the day will be shown at an early meeting of the Boston Group. The enthusiastic attendance at this outing should insure its successful repetition as an annual affair.

Chicago Group

THE Chicago Group, Rubber Division, A.C.S. will hold its first fall meeting on September 24 at the Sherman Hotel, Chicago, Ill. Dinner at 7 p.m. will be followed by an excellent program. C. H. Zieme, service engineer of Republic Rubber Co., with which he has been connected 26 years, will present an illustrated paper, "The Industrial Application of Rubber in Industry." The second feature, "Alaska in Color," a motion picture of thrills, will be presented by J. C. Nichols, Chicago Group member, who will return from Alaska in time to show the films at this meeting. The entire evening program has been arranged by George Ellinwood, of the Waukegan, Ill., plant of Johns-Manville Corp., who will act as chairman. Reservations should be sent to the Secretary, B. W. Lewis, c/o Wishnick-Tumpeer, Inc., Tribune Tower, Chicago.

Los Angeles Group

ON August 8, following a preliminary dinner at the Hotel San Diego, of elk steaks contributed by the Darnell Corp., 39 hopeful members of the Los Angeles Group, Rubber Division, A.C.S., embarked on the *Star Angler* —bound for the waters of tuna and yellowtail near the Coranado Islands, Mexico. Excellent weather, plenty of live bait, and a congenial crowd contributed towards a perfect voyage; but with the exception of W. G. Tapping, of the Cutler Hammer Co., the tuna and yellowtail were successful in avoiding the bait Quantities of calico bass and barricuda, however, which were caught by most everyone, served to appease the members' desire for the larger ones. While a few showed evidence of personal unsettled conditions, weather permitted the majority to enjoy their lunches and the galley.

For his skill in landing the 14-pound yellowtail, the only sport fish caught, Mr. Tapping was awarded the grand prize of a fine deep sea rod and reel. For his pessimism in guessing that only three sport fish would be caught, J. B. Cannon, of the United States Rubber Co., came closest to the actual catch and was presented with a cocktail shaker complete with six engraved glasses and a chrome plated streamlined Sparklet Bottle, all of which was donated by Binney & Smith Co.

Eighteen other prizes suitable for fishermen, and won by drawing, were donated by the following: H. M. Royal, Inc., Farrel-Birmingham Co., Blue Star Mines, Western Shade Cloth Co., J. M. Huber Co., Paterson Parchment Co., American Cyanamid & Chemical Corp., Pacific Coast Talc Co., San Francisco Sulphur Co., and Los Angeles Rubber Group.

Los Angeles Group Fishing Party

As a grand finale the raffle prize of $25 cash was won by R. E. Hutchinson, Firestone Tire & Rubber Co.

A permanent record of the trip made in movie film by Ed. Royal and Garvin Drew will be shown in the fall.

There were no permanent casualties, and as can be seen in the accompanying photograph (Courtesy James, Goodyear Camera Club) all members arrived back at the dock tired, sun tanned, and somewhat sleepy, but otherwise in good condition.

Thermal Softening Plastic

NUBA, a new inexpensive resinous pitch, manufactured by The Neville Co., Pittsburgh, Pa., may be used in rubber compounding as a filler and softener. Three grades are available as designated by their melting points: 80-95° C., 100-125° C., and 135-150° C. Its foremost characteristics are toughness and elasticity. Other properties are: brown to black in color; partly soluble in petroleum solvents upon heating; entirely soluble in aromatic solvents; softens upon heating; compatible with numerous other thermoplastic materials.

Nuba may be used to advantage in floor tile compounds, as it is reported to exhibit unusual penetration characteristics, high resistance to alkalis, and to impart good wear-resisting qualities. It does not become extremely brittle at low temperatures.

Blends of the Nubas with paraffine can be made to produce waxes with a wide range of melting points and be useful in the manufacture of insulating materials.

Rubber Peptizing Agent

A NEW rubber peptizing agent, RPA No. 2, is composed of ⅓ naphthyl-beta-mercaptan and ⅔ inert hydrocarbon. It is a white waxy material with a specific gravity of 0.94 and starts to melt at 50° C. In general the recommended procedure is to mill in 0.3% on the rubber of RPA No. 2, preferably at approximately 225° F. It is effective only during milling. Ordinary fillers have no effect on it, but sulphur, organic accelerators, and antioxidants retard its action. Since sulphur retards the softening effect, remilling has little tendency to decrease the plasticity. The softening action does not carry through to the finished product. Because of the necessity of elevated temperatures during the breaking down of the rubber with RPA No. 2, a Banbury mixer is ideal for the operation. Very little data are available regarding its action with reclaimed rubber, but it appears to be effective only in the presence of crude rubber. Solvent solutions of rubber containing RPA No. 2 are considerably less viscous.

RPA No. 2 is much less toxic than RPA No. 1. During six months' use in du Pont's Fairfield, Conn., plant no harmful effects have been noticed. The use of this material is described in Report No. 198, issued March 25, 1937, by E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Interesting Exposition

THE Sixteenth Exposition of Chemical Industries, to be held at Grand Central Palace, New York, N. Y., December 6 to 11, 1937, will present a detailed and interesting exhibit of chemical products, processing equipment, and machinery. Plans for this exposition are unusually well advanced now, three months before the opening.

Among the many recent achievements in research to be presented will be a chlorinated rubber base for paints, a low cost rosin for insulating compounds, a water and alkali resistant resin, and a liquid resin with plasticizing and adhesive characteristics.

A feature of the exposition will be a cash award of $250 to the person submitting the "best descriptive expression encompassing the purposes and the benefits redounding to the common good from the activities of the chemical industries." Prizes of $5 each will be awarded for the ten next best slogans. The contest, which closes on September 18, is open to any resident of the United States, Mexico, or Canada. Any number of slogans may be submitted, and the awards will be made at the exposition in December.

Editor's Book Table

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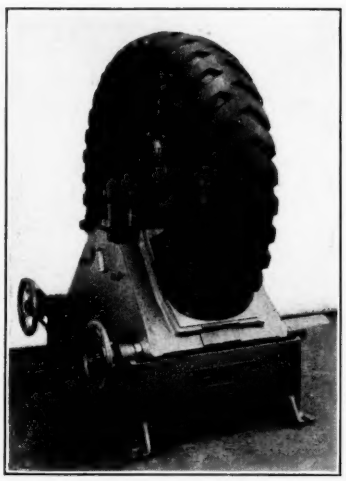
(Continued on page 82)

New Machines and Appliances



Repair Mold for Large Tires

Tire Repair Mold

A NEWLY developed adjustable tire repair mold (type FZ) is available for large tires with cavity widths from 10½ to 18 inches. Further reduction is accomplished by means of side plates. Heavy lug type tires may be handled by using special accessories which are available on order. Vulcanization is carried on by applying heat from the outside, supplemented on the inside of the tire by a steam bag, which also supplies pressure at the point of repair during vulcanization. James C. Heintz & Co.

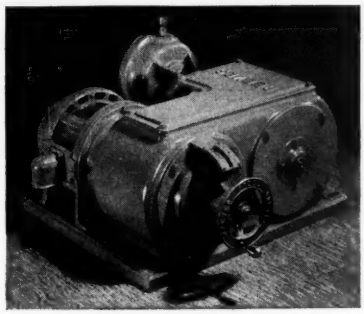
Variable Speed Drive

THE Vari-Speed Motodrive unit has been developed for use with machines where space is limited or where direct connection is necessary or desirable. The self-contained assembly consists of a constant speed motor, a variable speed control mechanism, and (where required) speed reduction gears.

A V-belt runs between two pairs of cone-faced disks mounted on parallel shafts. Of the two disks mounted on the motor shaft, the one next to the motor is fixed; while the other disk is movable laterally by means of a shifting screw actuated by a handwheel. Of the two disks mounted on the variable speed shaft, one is fixed and located diagonally from the fixed disk on the motor shaft. The other disk is movable laterally, and its position is governed by a tension spring which keeps it in proper contact against the special V-belt at all times.

By turning the handwheel, the movable disk may be adjusted to form any diameters needed to provide speed changes smoothly and quickly. The output speeds are registered on a convenient dial indicator.

This drive is adaptable to mounting in any convenient position, and the operating parts are easily accessible. Horizontal and vertical designs are available in five sizes which take motors from ¼ to 10 h.p. and cover cone speed reduction from two to one through six to one. In addition helical reduction gears can be had in ratios up to and including 189 to one. In different combinations of sizes, ratios, and reduction gears it is possible to obtain output speeds from 1.35 to 3,480 r.p.m. Reeves Pulley Co.



Horizontal Motodrive

Tire Regroover

Electric Grooving Tool

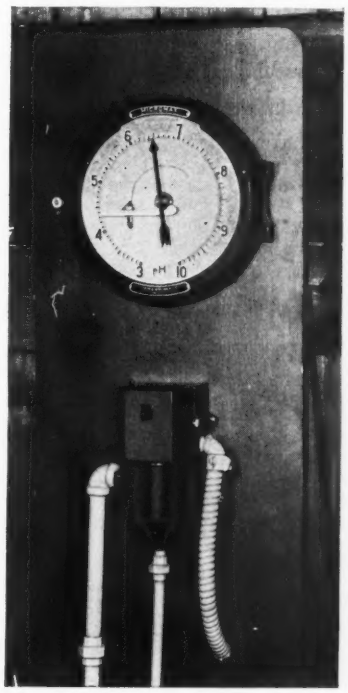
A PULL type tire regroover has a removable heating element which can be easily and quickly replaced. Electrically operated, it uses one blade adjustable to any desired depth from 1/32 to ½ inch size. The groove width can be increased by the insertion of shims. The regroover is available for either A.C. or D.C. current. Joseph Litt.

pH Water Controllers

FOR corrective water treatment, two separate sets of equipment are supplied depending upon whether the control is to be automatic or manual. For manual control, the equipment consists of a Micromax pH Indicating Recorder, an antimony-calomel electrode assembly, leadwire, and chemicals. The electrode assembly is installed so that the electrodes, which develop a potential proportional to the pH, are immersed in a continuously flowing sample of water being tested. A pair of electrical resistance thermometers automatically compensate for any change in water temperature. A Micromax Recorder is leadwired to the electrode assembly. In its potentiometer circuit, the potential from the electrodes is automatically balanced against the regulated potential from two dry cells.

The equipment for automatic control consists of a Micromax Controller, an antimony-calomel electrode assembly, a relay, a drive mechanism mounted on a valve or on a milk-of-lime feeder, leadwire, and chemicals. The electrode assembly is the same as that used for manual control. After being set at the desired pH value, the controller operates to hold the pH at this point. Any change causes an unbalance in the potentiometer circuit. Immediately the controller, operating through a relay detector, actuates a motor drive which increases or decreases corrective treatment. Where acid or alkaline reagent is added, its flow is regulated by a valve which is positioned by a drive mechanism. Where milk-of-lime heavier than 3° Baumé is added, flow is regulated by a milk-of-lime feeder.

Among the many industrial uses for this type of equipment are neutraliza-



pH Manual Control Assembly

tion, lime softening, corrosion prevention, and boiler feedwater treatment. Leeds & Northrup Co.

Plastic Extrusion Molding Press

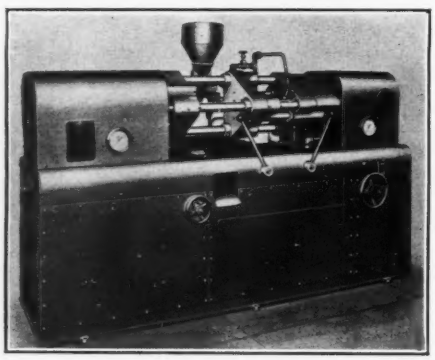
AN EXTRUSION press accomplishes high-speed production of small commercial plastic articles. The successive operations performed are: clamping the mold halves; feeding the plastic in original form; heating the material to proper plasticity; contacting plastic material chamber with mold inlet; extruding plastic material into mold cavities; opening the mold; and ejecting the finished articles.

The granular material is fed from a hopper directly connected with the heating chamber. A reciprocating plunger forces the material through a heated chamber where it is brought to the required plasticity. The plastic is then subjected to a high pressure for extrusion into the mold. The outlet from the extrusion chamber is through a small orifice in a nozzle. The end of the nozzle of smoothly rounded contour fits into the inlet in the back of the inner half of the mold.

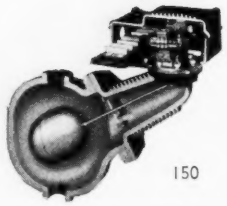
The two halves of the mold are carried on platens, one movable to and from the other for closing and opening. The inner platen has a floating action for bringing the mold inlet in contact with the extrusion nozzle. Communication from the mold inlet to the cavities is via passages known as the gate and runners. The gate is a hole of circular section and enlarging diameter extending from the inlet to the parting surface of the two mold halves. The runners are lateral distributing channels, connecting the inner end of the gate with the individual mold cavities. In a single cavity mold the gate usually feeds it direct without a runner. Both halves of the mold are chambered for the circulation of cold water to chill quickly the plastic after the cavities are filled.

The molded parts are automatically ejected as the mold halves are separated, the clamping member receding to its initial position. Both the clamping and extrusion pressures are independently regulated by means of the two hand wheels at the front of the machine, to the left and right respectively. These regulate the output of the two hydraulic generators which provide the operating pressures. Control of all machine movements may be either manual or automatic. For the former but two hand levers are required, located at the front of the machine. Automatic operation provides for predetermined timing of each event of the entire cycle, all properly correlated.

The chief advantages claimed for this machine are high production, the saving of mold expense, and reduction of labor costs. The Hydraulic Press Mfg. Co.



Hydraulic Plastic Extrusion Press



Boiler Control Unit

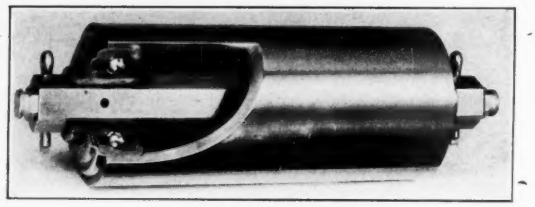
Boiler Pump Control and Low Water Cut-off

A BOILER control unit, designed for use with steam pressures up to 150 pounds, consists of a combination pump control and low water cut-off. A flexible metallic bellows transmits float power to the outside switch mechanism and eliminates the use of stuffing boxes.

The two controls have distinctly separate operating levels, and the differential between the two circuits is adjustable. Further, the differential between the "Off" and "On" operation of the controls is adjustable.

The pump control circuit turns on and off an electrically driven boiler feed pump in accordance with the water level required by the boiler. The low water cut-off circuit shuts off the oil burner or stoker in an emergency when the water reaches a predetermined low level. McDonnell & Miller.

Heavy Duty Press



Industrial Conveyer Roller

Roller for Industrial Conveyer

A NEW roller, designed for heavy-duty industrial conveyers, is constructed of 3½-inch O. D. seamless carbon steel tubing with a ⅛-inch wall. The bearings, also of new design, have steel labyrinth seals, hardened ball races, and ⅜-inch hardened steel balls, assembled within a pressed steel jacket. A hexagon axle, provides a means of locking the inner ball race, and has grease fittings applied at both ends. The roller, available in lengths ranging from six to 48 inches, has an average rated capacity of 2,000 pounds per roller. Mathews Conveyer Co.

Hydraulic Press for Rubber Sheets

AN HYDRAULIC press, with ten openings, designed for heavy tonnage and accurate work on rubber sheets, has a capacity of 2,500 tons and 42- by 42-inch platens. A 36-inch diameter ram provides 3,000 pounds' pressure per square inch over a 40- by 40-inch surface.

The cylinder is alloy steel casting, heat treated. Moving and top platens of cast steel are of heavy ribbed boxed sections. Steel steam plates 3½ inches thick are designed for 150 pounds' steam pressure. Instead of standard U-type packing, a multiple split molded packing is used. To maintain rigidity of the press, collars are applied on the tierods, and columns are provided with shrunk-on nuts to maintain the press in perfect alinement. Polished plates insure uniform thickness and surface of the rubber sheets. A. B. Farquhar Co., Ltd.

pH Determination

A RECENTLY market method for determining pH by the use of pH papers permits visual quantitative determination of the acid or alkaline content of solutions. These papers are as fast as Litmus papers and are reported to give accurate quantitative results at a glance. They are available in several ranges as follows:

1	5.2 to 6.7
2	3.6 to 5.0
3	3.7 to 5.3
4	1.2 to 3.4
5	0.9 to 1.5
6	9.5 to 11.0
7	11.0 to 13.5

New Goods and Specialties

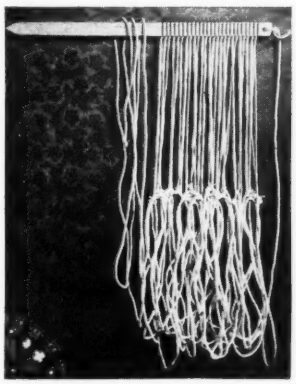
New Tire Line

THE "I. D." Tire especially designed for the independent dealer trade has been announced by the U. S. Tire Dealers Mutual Corp., 1790 Broadway, New York, N. Y. Built as a companion line to the U. S. Royal and U. S. Royal Master, this tire, to sell at popular prices, will be available in a complete range of sizes for both passenger cars and trucks.

"I. D." Tire

Rubber Aids Fishermen

SPONGE rubber is now used as a pad for embedding the hooks on a trot line jig or holder when the line is not in use. Owing to this safety feature the trot line may be carried about without danger of tangling, and the hooks will not catch in the fisherman's clothing. In use only one hook is exposed at a time as the others have been let out by the fisherman or are still held safely in the jig. Tangleproof Tackle Co.

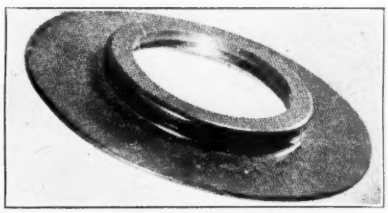


Tangleproof Trot Line

Center-Guide Belt Conveyer

THE new feature of this belt conveyer is the continuous central guide strip on the underside of the belt which holds the belt in place on the conveyer idlers. The central idler is grooved to receive the guide strip and in actual operation is very effective even though the belt is tilted at a considerable angle. The belt with this self-guiding feature is reported to have longer life since anti-friction conveyer idlers can be used and the edge guides are not necessary. In the case of very wide belts the construction may include more than one guide strip. This new type of belt is especially adapted, yet not limited, to underground work where conveyer belt maintenance is costly.

The center guide feature is covered by patents owned by Link-Belt Co. and can be manufactured by the leading rubber conveyer belt manufacturers according to Link-Belt Co. specifications.



"Thiokol" Grommet

Wing Tank Grommet

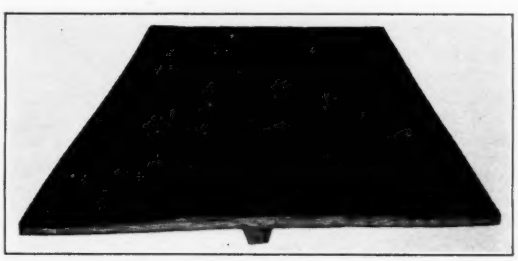
A GROMMET, made of "Thiokol," forms a protective four-inch bib around the gasoline tank spout on airplanes. This construction detail is applicable to tanks located in the wings and prevents spilled fuel from affecting the wing fabric. Rubbercraft Corp.

Commercial Truck Tire

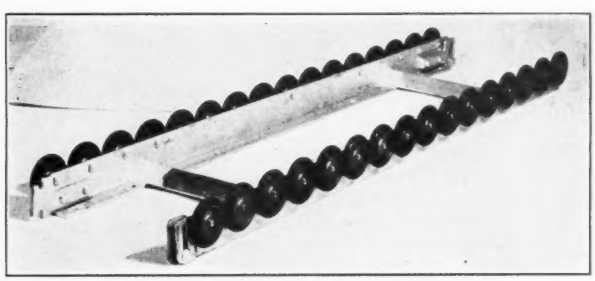
DESIGNED especially for trucks of ½- and ¾-ton capacity, a new line of tires is now being manufactured in the following sizes: 6.00-16, 6.50-16, 7.00-16, and 7.50-16. All are made with six plies; while the 7.50 tire is also made with eight plies. In the past light trucks have been generally equipped with passenger car tires. This line will fit present run equipment and provide advantages reported to be 22% wider tread and 11% heavier weight, which with the additional traction result in higher safe speed and greater mileage. B. F. Goodrich Co., Akron.

Anti-Vibration Conveyer Wheels

RECENTLY developed rubber-tired wheels are being mounted in conveyer frames so as to provide a cushioning effect when handling fragile or highly polished articles. The wheels are of pressed steel construction and are equipped with hardened steel ball races. The rubber tires, steamed while being stretched onto the wheels, contract upon drying, which tension fixes them solidly in the grooves between the wheel flanges. Designed for conveyers, these wheels are practical for many applications where quiet smooth travel is required, such as tea wagons, small hand trucks, and portable cabinets. Two available sizes of wheels with 2⅞ inches O. D. and 3½ inches O. D. including the tires have rated load capacities of 20 and 50 pounds respectively. Mathews Conveyer Co.



Belt with Single Center Guide



Rubber Tired Conveyer

Rubber Industry in America

FINANCIAL

Unless otherwise stated, the results of operations of the following companies are after deductions for operating expenses, normal federal income taxes, depreciation, and other charges, but before provision for federal surtax on undistributed earnings. Most of the figures are subject to final adjustments.

American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y., and subsidiaries. Six months ended June 30: net profit, $2,844,325, equivalent to $1.13 a share on 2,520,368 shares of combined Class A and Class B common stocks outstanding at the end of this period, but excluding shares held by subsidiaries. This compares with a net profit of $1,708,003, or 68¢ a share on the combined shares, for the six months ended June 30, 1936. The net income does not include the company's equity in the undistributed net income of certain affiliated companies in which the company does not have a majority interest.

American Zinc, Lead & Smelting Co., Columbus, O., and subsidiaries. June quarter: net profit, $81,074, equal to $1.25 each on 64,834 shares of $5 convertible prior preferred stock, against $92,530, equal after dividends on preferred to 1¢ each on 650,254 common shares in preceding quarter and $10,669 or 14¢ a share of 75,000 preferred shares in the June quarter of 1936. Six months to June 30: net profit, $173,605, equal after prior preferred dividend requirements for the period to $2.85 each on 4,041 shares of old $6 preferred stock on which dividend arrears total $90 a share. In the first half of 1936 there was a net loss of $32,636. Under a recapitalization plan to clear up arrearages on the old $6 preferred stock the company offered one share of new prior preferred and six shares of common for each share of old preferred. Net profit for the 12 months to June 30, 1937, was $258,577, after $425 surtax, equal to $3.99 each on 64,834 shares of $5 prior preferred stock. This contrasted with net loss of $152,343 for the 12 months to June 30, 1936.

Anaconda Wire & Cable Co., 25 Broadway, New York, N. Y., and subsidiaries. Three months ended June 30: net income, $834,041, equivalent to $1.98 on each share of outstanding capital stock, compared with $632,148, or $1.50 a share in the second quarter of 1936. Gross revenues for the June quarter this year were $1,742,285, against $1,290,921 last year.

Barber Co., Inc., Philadelphia, Pa., six months to June 30: net profit, $402,794, equal to $1.03 each on 390,223 shares, compared with 71,567, or 18¢ a share, last year. Net profit for the 12 months ended with June amounted to $775,772, equal to $1.98 a share, compared with $124,131, or 32¢ a share, for the 12 months ended June 30, 1936.

Dewey & Almy Chemical Co., Cambridge, Mass. Six months to June 30: net earnings, approximately $290,700. After regular dividends on preferred stock aggregating about $79,000, earning were equivalent to $3.50 a share on 60,344 common shares outstanding. Since the company previously had reported earnings on annual basis only, comparison with the same period of 1936 is not available. Net earnings for 1936 available for preferred and common stocks totaled $341,556.

Fisk Rubber Corp., Chicopee Falls, Mass., and subsidiaries. Six months to June 30: net profit, $435,962, equal to 75¢ each on 439,442 common shares after dividend requirements on 35,285 shares of $6 preferred. This compares with a net loss of $141,418 in the first half of 1936.

Flintkote Co., R.C.A. Bldg., New York, N. Y. Thirteen four-week periods ended July 17: net income, $1,358,868 after federal, state, and foreign taxes. The year's profit was equal to $2.03 each on 668,746 shares of stock outstanding and compared with one of $1,156,245, or $1.73 each on 668,046 shares of stock then outstanding, in the preceding 52 weeks. For the first seven four-week periods of its fiscal year the company reported a net income, after federal, state, and foreign taxes, of $659,233, equal to 98¢ a share on the outstanding stock, against a net income of $471,399, or 71¢ a share, in the first seven periods of last year. For the four periods ended on July 17, net income after federal, state, and foreign taxes was $465,648, or 70¢ a share, against $436,101, or 65¢ a share, in the same period of 1936.

For the year to July 17, net sales were $15,122,687, against $12,509,769 in the preceding 52 weeks. For the seven four-week periods ended on July 17, net sales were $8,213,211, against $6,766,782 a year before, and for the four periods net sales were $4,900,143, against $4,206,063.

Freeport Sulphur Co., 122 E. 42nd St., New York, N. Y. Six months to June 30: consolidated net income, $1,279,841, equal to $1.56 a share on 796,380 shares of outstanding common stock after provision for preferred dividends. This compared with earnings of $1,014,872, or $1.22 a share in 1936. Company's share of earnings of its subsidiary, Cuban-American Manganese Corp., amounted to $54,699, or 7¢ a share on Freeport's common stock.

Garlock Packing Co., Palmyra, N. Y., and subsidiaries. Six months to June 30: net income, $659,814, equal to $3.15 each on 209,250 capital shares, against $451,102 last year, after surtax, equal to $2.15 a share.

General Tire & Rubber Co., Akron, O. Six months ended May 31, 1937: net sales, $10,212,794.86, resulting in a profit of $991,262.21, after provision for federal income tax, but before allowances for excess profits tax and surtax on undistributed profits. This sum, after deducting preferred dividends of $81,375, means a profit of $2.01 per common share on the basis of the 452,875 common shares outstanding on May 31. Since that date 64,697 additional common shares have been sold to stockholders, making the total common stock outstanding 517,572. On the basis of the present outstanding common stock, the profit for the first half of 1937 would be $1.76 a share. During the entire fiscal year of 1936, General Tire sales totaled $17,909,886.26, and the net profits for the 1936 twelve-months' period amounted to $2.53 a share. No figures were announced for the first half of 1936, but the profit for the first half of 1937 was reported substantially higher than during the same period last year.

The B. F. Goodrich Co., Akron, O. Six months ended June 30: consolidated net profit, $4,010,697, compared with $2,727,606 in the like 1936 period, and after depreciation, interest, and estimated federal income tax, but before setting aside a reserve of $500,000. After deducting this reserve, there remained $3,510,697 to be carried to surplus, and after provision for preferred dividend requirements for the period this was equal to $1.90 a share on the 1,303,255 shares of common stock outstanding. Net profit was calculated without provision for federal undistributed profits tax. In setting a new first six months record, net sales of Goodrich increased to $78,566,619 from $65,994,521 in the like 1936 period. The last previous high for the first period

was in 1930 when sales totaled $78,007,-291. Current assets of $86,996,018 on June 30 were 4.57 times greater than current liabilities, which were $19,017,-004. Domestic bank loans amounted to $1,600,000 on June 30.

Goodyear Tire & Rubber Co., Akron, O., and subsidiaries. Six months ended June 30: consolidated net sales, $116,-475,700, against $90,908,684 for the same period of last year. Consolidated earnings amounted to $11,396,235 before interest and other charges, after providing $3,942,938 for depreciation of plant buildings, machinery, and equipment, and after provision for normal federal income taxes. No provision has been made for any surtax on undistributed net profits. Net consolidated earnings were $9,568,352 after all deductions for interest and discount charges and for the equities in undistributed earnings of subsidiary companies applicable to stocks not held by the company. Set aside for contingencies was a reserve of $1,500,000, leaving a balance of $8,-068,352 carried to earned surplus.

Intercontinental Rubber Co., 745 Fifth Ave., New York, N. Y. Six months to June 30: consolidated net income, $154,437.87, equal to 26¢ each on the 596,004 capital shares outstanding. For the first half of 1936, the company reported a net loss of $7,207.81.

Jenkins Brothers, Inc., Bridgeport, Conn. Six months to June 30: net income, $264,964, equal after dividends on 7% preferred stock to $1.91 each on 127,516 common shares. This compares with $160,278, or $1.10 a share, earned a year earlier.

Lima Cord Sole & Heel Co., Lima, O. Six months to June 30: net income after reserve for federal taxes, $107,697, equal to 95¢ each on 112,600 shares of $1-par capital stock outstanding. For seven months to July 31, 1936, company showed net income of $33,574, or 30¢ a share.

Monsanto Chemical Co., St. Louis, Mo. Second quarter, 1937: net earnings, $1,441,405, or $1.29 a common share, compared with $1,035,730, or 93¢ a share, in the June quarter of 1936. Earnings for the recent quarter were the largest on record for the June period. Net income for the first six months of 1937 was equal to $2.49 a common share, against $1.86 a share in the first half of 1936.

New Jersey Zinc Co., 160 Front St., New York, N. Y. Six months ended June 30: net profit, $4,351,782, equal to $2.21 a share on 1,963,264 capital shares, compared with a net profit of $2,339,-772, or $1.19 a share on the stock, in the first half of 1936. Quarter ended June 30: net profit, $2,181,941, equivalent to $1.11 a share on the stock, compared with a net profit of $1,265,593, or 64¢ a share, in the June quarter last year.

Pharis Tire & Rubber Co., Newark, O. Six months ended June 30: net profits, $23,673, after surtax on undistributed profits, equal to 10¢ a share on 220,000 common shares, compared with a net profit of $59,413, or 27¢ a share on the stock, the first half of 1936.

Philadelphia Insulated Wire Co., Philadelphia, Pa. Six months ended June 30: net profit, $17,455, equal to 94¢ a share on 18,525 capital shares, compared with a net profit of $24,731, or $1.33 a share on the stock, for the similar six months last year.

Raybestos-Manhattan, Inc., Passaic, N. J. Six months ended June 30, 1937: net income, $1,510,642.40, or $2.37 per share on the company's stock, after providing for all charges, expenses, and taxes, and adding $150,000.00 to the reserve for contingencies for the surtax on undistributed profits, etc. In the same period of 1935 net income was $989,122.22, or $1.55 per share, before providing for the surtax.

Thermoid Co., Trenton, N. J. and domestic subsidiary. Six months to June 30: net profit, $250,281, equal to 40¢ each on 469,823 common shares, after six months' dividend requirements on 40,556 shares of preferred stock, compared with a net profit of $140,656, or 17¢ a common share, for the six months to June 30, 1936.

St. Joseph Lead Co., 250 Park Ave., New York, N. Y., and subsidiaries. Six months to June 30: net profit, $4,507,-360, equal to $2.30 a share on 1,955,680 shares of $10-par stock. In the first half of 1936 the company showed a net profit of $647,175 or 33¢ a share.

United States Rubber Co., 1790 Broadway, New York, N. Y. Six months ended June 30: sales, $94,775,-938, an increase of $23,375,304 over the corresponding period of 1936. Net income for the period was $4,500,609 after provision for current charges. No provision has been made for surtax on undistributed profits. The cost of operations includes approximately $7,000,-000 for excise of 1936 sales, social security, property, capital stock, franchise, stamp and income taxes, etc. Because of the continued uncertainty in the market prices of crude rubber and cotton, a further reserve of $1,000,000 was created from current earnings. The total reserve for this purpose is now $3,000,000. By reason of a change in accounting procedure which became effective January 1, 1937, earnings for the period have been calculated on the basis of actual cost of inventories to date, which is the method heretofore used in calculating earnings for the full year. Earnings for the first half of previous years were calculated on the basis of predetermined cost of inventories which usually resulted in the setting aside of temporary reserves which were returned to earnings at the close of the year. The 6% Bonds of the Dominion Rubber Co., Ltd., due in 1946 are being called for payment on October 1, 1937. The plantations had a profit of approximately $2,500,000 after provision for depreciation and amortization of $950,000 and all other charges. This profit has not been included in the income of U. S. Rubber.

United Carbon Co., Charleston, W. Va., and subsidiaries. Six months ended June 30: net profit, $1,365,368, equal to $3.43 a share on 397,885 common shares, compared with a net profit of $1,087,607, or $2.73 a share on the stock, in the first half of 1936.

The Okonite Co., Passaic, at a meeting of the directorate July 27 elected to redeem the entire amount of its outstanding 7% cumulative preferred stock on September 1, 1937, at $115 per share, plus an amount equal to all unpaid dividends thereon, whether or not earned or declared to the date of the redemption thereof. Holders of these shares are required to present them for redemption at the Guaranty Trust Co. of New York, 140 Broadway, New York, N. Y., on or after September 1.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Anaconda Wire & Cable Co.	Com.	$1.00	Sept. 13	Aug. 13
Brown Rubber Co.	Com.	$0.10 extra	Sept. 15	Sept. 1
Brown Rubber Co.	Com.	$0.15 q.	Sept. 15	Sept. 1
Canadian Industries, Ltd., "A" and "B"..	Com.	$1.75 increased	Oct. 30	Sept. 30
Canadian Industries, Ltd., "A" and "B"..	Pfd.	$1.75	Oct. 30	Sept. 30
Dewey & Almy Chemical Co.	Com.	$1.00	Aug. 10	Aug. 5
Faultless Rubber Co.	Com.	$0.50 q.	Oct. 1	Sept. 15
B. F. Goodrich Co.	Com.	$0.50	Sept. 30	Sept. 18
B. F. Goodrich Co.	$5 Pfd.	$1.25 q.	Sept. 30	Sept. 18
Goodyear Tire & Rubber Co.	Com.	$0.50	Sept. 15	Aug. 19
Goodyear Tire & Rubber Co.	$5 Pfd.	$1.25 q.	Sept. 15	Aug. 19
Hewitt Rubber Co.	Com.	$0.25	Sept. 8	Aug. 26
I. B. Kleinert Rubber Co.	Com.	$0.15 special	Sept. 30	Sept. 15
I. B. Kleinert Rubber Co.	Com.	$0.15 q.	Sept. 30	Sept. 15
Lima Cord Sole & Heel Co.	Com.	$0.12½ reduced	Aug. 20	Aug. 10
Martin Custom Made Tires Corp.	8% Pfd.	$0.10	Sept. 15	Sept. 1
Mid-West Rubber Reclaiming Co.	$4 Pfd.	$1.00 q.	Sept. 1	Aug. 20
Pharis Tire & Rubber Co.	Com.	$0.15 q.	Aug. 20	Aug. 5
Okonite Co.	7% Pfd.	$1.75	Sept. 1	Aug. 24
Okonite Co.	6% Pfd.	$1.50 q.	Sept. 1	Aug. 24
Raybestos-Manhattan, Inc.	Com.	$0.50	Sept. 15	Aug. 31
Rex Hide, Inc.	Com.	$0.25 q.	Sept. 15	Aug. 31
United Elastic Corp.	Com.	$0.20 q. increased	Sept. 24	Sept. 3

HOLLYWOOD SUGGESTS BALLOON JUMPING as a new and novel way of maintaining physical fitness. Four balloons, filled with gas are tied to the wrists and ankles and they make one bouyant, thus lending zest and excitement to the sport.

EASTERN AND SOUTHERN

THE usual summer recession was experienced in varying degrees throughout the nation. But the upward trend of industry and commerce, according to government authorities, should be resumed about the end of this year. Among favorable factors for continuing "last year's marked upswing in business," they listed:

"Excellent crop prospects, decreased labor unrest, generally improved business sentiment, easy credit, the still large replacement needs arising from purchases deferred during the depression, improved world trade conditions, and the general impetus of the recovery movement."

The output of several large industries in recent months has been larger than sales, although an accumulation of back orders "may be sufficient to keep them going with little more than the usual summer recession until a larger volume of new orders is received."

Another expert, also viewing the future with optimism, states, "In the first six months of this year the volume of industrial production has exceeded that of the same months of 1936 by 19%. Factory employment has been greater by 14%, and factory payrolls have been 29% larger than those of the corresponding months of 1936.

"The agricultural outlook remains favorable. Farm prices have risen until they are now almost at their pre-war parity with the prices of non-agricultural products. There is good prospect that most agricultural yields will be large this year. . . . Farmers are still receiving large totals of government payments, and high levels of farmer purchasing power seem assured.

"Business sentiment has become much more optimistic as a result of developments in Washington, the recent decreases in labor difficulties, and of the advances under way during the past weeks in the security markets. One fundamental element in the business situation is much less favorable than are those that have been mentioned. It is the fact that the flow of new funds into business enterprises is not increasing in proportion to the expansion of production and trade."

Class I railroads in the first half of 1937 installed 34,187 new freight cars, the largest number for any corresponding period since 1930, according to the Association of American Railroads. In the same period last year 11,604 new freight cars were put in service, and 1,868 in the corresponding months two years ago. New freight cars put in service in the first six months of 1930 totaled 49,258.

During the summer a few industries advanced contraseasonally, i.e., building construction and lumber. Oil refining operations increased to reach new weekly records; yet stocks of gasoline were reduced.

In the South, with any reasonable price maintenance, cotton will bring a situation akin to a boom. Tobacco sales are heavy, and the price level remains steady to higher, to stimulate business generally and is an encouraging factor in the leaf belts where the markets have not yet opened. Agricultural production in other lines is highly satisfactory. Sharp decreases in relief rolls and further improvement in private industrial employment appeared.

Titanium Pigment Election

Titanium Pigment Corp., 111 Broadway, New York, N. Y., recently elected Vice President C. F. Garasché president to succeed Ralph M. Roosevelt, resigned. Elected a vice president was General Sales Manager Ivan D. Hagar. Mr. Garasché also recently was made manager and Mr. Hagar assistant manager of the National Lead Co., Titanium Division.

Blank & Stoller

C. F. Garasché

Chidnoff

Ivan D. Hagar

The new president was born in St. Louis, Mo., 47 years ago and after being graduated from the elementary and Central High schools there, worked for a railroad five years. Then he entered the metal business as purchasing agent and traffic manager for the Picher Lead Co., St. Louis, and in 1916 after it consolidated with the Eagle Lead Co., he became assistant general manager for the Eagle-Picher Lead Co. at Newark, N. J., in charge of the construction and operation of the litharge and red lead plant there. During the World War, Mr. Garasché was a lieutenant in the U. S. Army Signal Corps and was also an aviation pilot. In 1921 he joined the National Lead Co., as assistant to the production manager and continued until 1933, when he was made vice president and director of National Lead's associate company, the Titanium Pigment Co. Last year he was named also assistant manager of the Titanium Division of the National Lead Co.

Mr. Hagar has been with Titanium Pigment 16 years, serving in several sales executive capacities. In 1936 he was elected a director of the company. His sketch has appeared in our July, 1936, issue, page 56.

INDIA RUBBER WORLD, 420 Lexington Ave., New York, N. Y., has been appointed authorized distributer in the United States for the monthly *Statistical Bulletin of the International Rubber Regulation Committee*, London, England, containing complete information regarding quotas, production, absorption, stocks, and prices of rubber.

I. B. Kleinert Rubber Co., 485 Fifth Ave., New York, N. Y., last month held its annual sales convention at the Waldorf-Astoria Hotel, at which President Ralph K. Guinzburg reported a 17% gain in sales for the first half of 1937, compared with the corresponding 1936 period. He also announced an increase of about 25% in the company's fall advertising campaign to feature dress shields, Braforms, sanitary goods, shower curtains, etc.

The National Lead Co., 111 Broadway, New York, N. Y., has provided for its 5,000 employes approximately $18,000,000 of group life insurance in a plan underwritten by the Metropolitan Life Insurance Co. National Lead and its employes share the cost. The insurance plan supplements a group retirement annuity program installed by the company last January and supersedes a death benefit plan operated by the company for several years.

General Atlas Carbon Co., 60 Wall St., New York, N. Y., will build a new plant at Guymon, Okla., for the production of its products, Gastex and Pelletex, to consist of four units with a capacity of 12,000,000 pounds of carbon pigment yearly. It should be in operation by the Spring of 1938. Most of the equipment at Guymon will be fabricated of special alloy metals whose resistance to corrosion will insure a product of exceptional purity and uniformity. The plant will be on the main line of the Rock Island Railroad, which will permit the prompt delivery of tank car shipments of Pelletex, as well as the usual shipments in paper bags. The gas required for production will be purchased from the Cabot Carbon Co. whose extensive holdings in the Guymon area insure an unlimited supply of raw material. The choice of Guymon, Okla., as the site for its new plant carries out the company's policy of not having all of its manufacturing interests confined to one state. The advantage of this policy is that the two plants, located in different states, will not be subject to the same state rules and regulations governing the use of natural gas, thus insuring a more stable supply of Gastex and Pelletex at a uniform price.

The General Electric Co., Schenectady, N. Y., on August 13 announced an increase of an additional 1% in its Cost of Living Adjustment plan, raising it from 4 to 5%. Instituted in October, 1936, the plan provides for automatic increases in employe earnings, based on the progress of the Cost of Living Index as published by the United States Department of Labor. According to the terms of the plan, if the cost of living goes up, 1% is added to employes' earnings for each point of rise in the index up to 90. If the cost of living goes down, adjustments will be made until the index reaches 80. The plan further provides that the adjustment may take place at the halfway mark between each point. The present index figure of 84.5 thus permits the employe earning increase to 5%.

Stein-Brill Corp., 183 Varick St., New York, N. Y., has changed its corporate name to Brill Equipment corp., but has made no change in management. Beside the firm has opened an office and warehouse in the Mart Bldg., St. Louis, Mo., which will represent also several nationally known machinery manufacturers in the St. Louis territory and will have display rooms in the Mart Bldg. for this purpose. Both the eastern and midwestern offices will specialize in machinery and equipment for several industries including the following: chemical, paint, plastics, and rubber.

Lee Tire & Rubber Co. of New York, Inc., Conshohocken, Pa., elected a member of the Association of National Advertisers, will be represented by George H. Duck.

Rubber Supports Movable Stage

The huge stage at Randall's Island Stadium, New York, is supported by 224 tractor wheels with 7.50-10 Goodyear tractor tires. The stage, mounted on a steel frame, weighs approximately 250 tons and measures 80 by 140 feet. The rubber-tired wheels are attached to individual steel frames with swivels mounted by threaded bolts which can be adjusted to give the desired height.

The stage, said to be the largest outdoor stage in the world and the only movable one, is moved under the power of a tractor when it is desirable to clear the field for athletic events.

Johns-Manville Promotions

Seven promotions, including the election of three new vice presidents, were announced August 1 by Lewis H. Brown, president of Johns-Manville Corp., 22 E. 40th St., New York, N. Y. The new vice presidents of the J-M Products Corp., a subsidiary controlling most of the company's manufacturing and mining activities, are A. R. Fisher, formerly manager of the factory at Manville, N. J.; J. P. Kottcamp, formerly manager of the factory at Waukegan, Ill.; and Alexander Cromwell, currently manager of the Pacific Coast manufacturing operations. These men have general supervision over newly established manufacturing districts, each of which includes five factories. Mr. Fisher has been assigned the eastern district; Mr. Kottcamp, the central division; and Mr. Cromwell, the Pacific Coast.

J. E. Begert, formerly head of the cost reduction department at J-M headquarters in New York, succeeds Mr. Fisher as manager of the Manville plant. At the Waukegan factory K. W. Huffine, formerly manager of the Alexandria plant, has been named Mr. Kottcamp's successor. H. J. O'Brien, formerly superintendent of the rock wool department at Manville factory, has become manager of the Alexandria plant. W. Kelty, formerly assistant to Mr. Begert, succeeds him to the managership of the cost reduction department.

Coincident with the establishment of these new manufacturing districts, Johns-Manville has consolidated its mining operations at Asbestos, P. Q., and Chrysotile, Ariz., to form the Asbestos Division, under the charge of C. H. Shoemaker, who is also vice president of Canadian Johns-Manville Co., Ltd.

Mr. Brown has also announced that E. S. Crosby has been named president of the Johns-Manville International Corp., a subsidiary. Mr. Crosby joined Johns-Manville in 1928 when it absorbed the Celite Co., of which he was vice president and a director. His first position with J-M was as general manager of the engineering department. In 1929, when the Johns-Manville International Corp. was formed, he became vice president and general manager. The presidency of the International corporation had been held by Mr. Brown. Besides his new post Mr. Crosby is also general manager of both Asbestos Fibres Distributers and the Replacement Automotive Products Department, both divisions of the J-M Sales Corp.

Vulcanized Rubber Co., Morrisville, Pa., announces the appointment of John M. Taylor as new industrial engineer. He is a native of New England and is a graduate of the Massachusetts Institute of Technology, Boston. The Vulcanized company has enlarged its chemical laboratory and office building and reports that business continues good.

The New Jersey Zinc Co., 160 Front St., New York, N. Y., recently reported the following personnel changes. J. Edward Gross, assistant credit manager in eastern sales territory, has been made credit manager of the same territory and will be located in New York. R. J. Mackessy, assistant credit manager, has been promoted to manager of collections, with headquarters in New York. J. W. Heylmun, formerly employed by the Mineral Point Zinc Co., subsidiary of New Jersey, at Depue, Ill., has been named assistant credit manager in western sales territory for New Jersey Zinc and will be at the Chicago office, 221 North La Salle St.

The International Acetylene Association, 30 E. 42nd St., New York, N. Y., will hold its thirty-eighth annual convention in Birmingham, Ala., November 10, 11, and 12. Headquarters will be the Hotel Tutwiler. Technical sessions will be held each afternoon. Special sessions of unusual interest, the details of which will be announced at a later date, are being planned for the evenings. The oxy-acetylene process for welding and cutting metals will be featured at all these sessions. As a result of a year of unusual development, a series of vitally interesting subjects will be discussed by speakers who are key men in their fields.

H. Homer Bashore has announced that on August 16 he severed connections with Whitehead Bros. Rubber Co., Trenton, N. J., to join the Vulcanized Rubber Co., Morrisville, Pa., as assistant chemist to C. P. Morgan. Mr. Bashore had previously worked for The B. F. Goodrich Co., Akron, O., and the Quaker City Rubber Co., and the Franklin Rubber Co., both of Philadelphia, Pa. During this time he has also developed a new rebound resiliometer and a new puncture-tear test and new hose flexing machine. Mr. Bashore is a member of the Rubber Division, A. C. S., and is fond of golf, tennis, chess, and swimming. He is married and lives at Two Scammell Ave., Trenton.

U. S. Rubber News

United States Rubber Products, Inc., 1790 Broadway, New York, N. Y., and its Passaic, N. J., plant recently received a contract from the United States Navy for $27,813.32 worth of packings, for delivery June 30, 1938.

On August 14 more than 5,500 of the employes of the company's footwear division, Naugatuck, Conn., and their friends gathered at Waterbury, Conn., for their third annual outing. Athletic events, refreshments, dancing, and boating were features of the day.

Tire Dealers Corp. Notes

An innovation in tire merchandising was recently introduced by U.S. Tire Dealers Mutual Corp., when C. F. Orgill, manager of the organization's Portland, Ore., district, placed a trailer tire display in operation. Through this new traveling exhibit dealers throughout the Portland territory, which includes all of Oregon and parts of Idaho and Washington, can inspect the complete line of "U.S." tires, tubes, batteries, and accessories. Large users of tires also will have the opportunity to see which of the 21 types of tires carried in the trailer are best suited to their needs. Besides displaying various tires, the trailer is equipped to present sound films which will enable dealers and their customers to visualize the scope of U.S. Rubber's manufacturing activities. Films tracing manufacture of tires from the first operation in the factory to the finished product, as well as sound films illustrating the latest merchandising methods, will be carried in the display at all times. The trailer display was designed by Mr. Orgill and built in Portland. It is the first display of its kind ever used by the company.

The twin core, advanced 1938 model U. S. hot water heater for automobiles, which gives "thicker" heat, has been announced by the Tire Dealers Corp. "Thicker" heat, the most efficient heat yet generated for driving comfort in cold weather, has been achieved by a perfect balance between air circulation and heating surfaces, it is reported. As the cool air is sucked into the heating unit, circulation is so arranged that all the air becomes thoroughly heated by the twin heating cores before it is allowed to leave the unit As a result, all the air which enters the car through the heater is "heating" air, warm, clean, and free from fumes, heated and circulated by the same principle as used in modern heat conditioned homes.

The power windshield defroster, equipped with its own power unit, is designed to provide heated air in great force over a large area without interfering with heater performance.

Licensing Plan for Two-Way Stretch Garments

The following statement of licensing policy has been issued by U. S. Rubber.

"The United States Rubber Co. announces to the Corset and Foundation Garment Industry and the retail trade that it has acquired United States patent rights covering two-way stretch garments of the corset and girdle type. These rights apply to knitted as well as woven types of garments. An idea of the scope of these patent rights is given by the following typical claim contained in the Patent No. 1,919,292 which is owned by U. S. Rubber.

"A garment of the character described adapted to encircle the hips of the wearer, confine the posterior portions and be worn next to the body, said garment comprising porous material having elastic strands extending in one direction and elastic strands inter-engaged with said first-named strands and adapted to permit the material to stretch simultaneously in another direction, whereby said material is capable of stretching up and down as well as across, said material being positioned at the rear of the wearer and extending between points above and below the plane of maximum girth of the posterior portions of the wearer; said garment being thereby constructed and arranged to permit freedom of movement of the wearer while exerting a distinct confining action on the parts within the garment and being also prevented from riding up on the wearer.

"The patent rights also include claims relating to the fabric as well as to the garment. There are other patent applications which we control, and under which we propose to grant licenses embodying the same general type of claims and which collectively disclose a considerable number of different types of fabrics. We expect these applications to mature into additional patents in the near future.

"Knitted fabric manufacturers, woven fabric manufacturers, and corset manufacturers are now being invited to apply for *royalty-free* licenses to utilize these patent rights.

"The licenses to the woven and knitted fabric manufacturers provide that, in order to safeguard construction and maintain quality, each manufacturer shall submit a specimen of each type of fabric to be made under these rights and shall obtain a written approval of such fabric from the licensor before offering the fabric for sale.

"The *royalty-free* license to the corset manufacturer provides that the licensee shall use an identifying label on all garments made under these patent rights. It also provides that the licensee shall use in garments manufactured under these patent rights only such two-way stretch fabrics as have been made by fabric manufacturers licensed by the company to make and sell these fabrics.

"An up-to-date list of licensed manufacturers manufacturing and selling two-way stretch fabrics will be furnished from time to time on application.

"A suitable period of adjustment will be given to enable retailers and manufacturers to dispose of existing inventories."

OBITUARY

William E. Callahan

WILLIAM E. CALLAHAN, 60, of Oak Park, Ill., for 17 years a mechanical engineer with the United States Rubber Co., died August 3 of a heart attack. He leaves his wife and four children.

J. W. Thropp

JOSEPH WILKES THROPP, secretary-treasurer of William R. Thropp & Sons Co., manufacturer of rubber machinery, Trenton, N. J., died July 28 at a Trenton hospital, having been in poor health since last April. Mr. Thropp was born in Trenton in 1887. He attended the Model School, Trenton, then was graduated from Drexel Institute, Philadelphia, Pa., in 1906, having specialized in mechanical engineering. He became associated with his father in business and was with the company since 1906.

Mr. Thropp belonged to the National Safety Council, Masonic fraternity, Bristol Bay Head Yacht Club, and Rotary and Carteret clubs of Trenton. He was, too, a director of the American Automobile Association, Greenwood Cemetery Association, Anchor Warehouse Co., and Chamber of Commerce, all of Trenton. His hobbies were fishing and sailing.

He is survived by his mother, his wife, a son, a brother, and a sister. Burial was in Greenwood Cemetery, Trenton.

J. W. Thropp

Hohwieler Rubber Co., Morrisville, Pa., is now working on hockey and football material for the jobbers' winter trade. William H. Hohwieler, president of the company, was chairman of the Morrisville Chamber of Commerce outing in August.

International Printing Ink Corp., 75 Varick St., New York, N. Y., recently changed its name to Interchemical Corp. as the old name proved inadequate to describe the firm's rapidly broadening activities.

OHIO

TRADE seems good in Ohio. Recent activity in the industrial construction field has lifted contracts to the highest level since 1929. One authority reported the demand for replacement tires is declared to have slowed down after a good spring. Margin of profit, however, is better since the drop in cotton and crude rubber prices.

General Tire News

Formation of a new automobile tire department in the sales organization was recently reported by L. A. McQueen, sales manager of the General Tire & Rubber Co., Akron. This department will be the contact point for the field sales organization for all matters not coming under the supervision of either Karl A. Dalsky, who will continue to handle truck tire sales, national and commercial accounts, manufacturers' quotations, and the sale of Jumbo streamline tires, or of Ernest C. Leach, who continues supervision over all accessory and battery items, repair materials, radios, and similar lines.

John C. Ink is head of the new tire department. He has been with General for 13 years in the sales department in Cincinnati and Akron. For the past seven years he had charge of one of the company's sales divisions.

Assisting all three divisions in the handling of sales work at the Akron office will be George A. Gear, transferred from the stock distribution department; D. F. Martine, from the advertising department; and T. K. Fontaine, of the sales department, to each of whom have been assigned specific sales branches.

Charles L. Howes, in charge of one of the sales divisions in the Akron office, has been made manager of sales in the Akron district. He has been with the General Tire sales organization many years.

Mr. McQueen also announced several changes in division, district, and branch managers in the company's sales organization.

Howard A. Bellows, formerly central division manager with headquarters in Akron, has been made eastern division manager, with headquarters in New York, succeeding Frank J. Savage, on leave of absence. Besides supervision of the New York district, of which he was formerly manager, Mr. Bellows also takes over the management of the company's Philadelphia branch. A. W. Barry, formerly Philadelphia branch manager, has been assigned to special work in New York.

Roy Doss, formerly branch manager in San Francisco, has been named Chicago district manager, succeeding E. F. Parker, who died July 6. Mr. Doss joined General Tire in Los Angeles in 1925 as a salesman, then went to Seattle as branch manager, and later to San Francisco in the same capacity.

Howard Stroupe, for the last five years Seattle branch manager, replaces Mr. Doss as San Francisco branch manager. The former has been with General for more than 20 years, on the Pacific Coast the entire time.

J. S. Peixotto, who has been doing special work in San Francisco, is now the Seattle branch manager.

The company's former central sales division has been divided into two districts. Bruce Gregory, formerly assistant manager of the central division, has been appointed manager of the Cleveland district, with headquarters in Akron, and F. W. Darbro, former central division salesman, has been made manager of the new Cincinnati district, with headquarters in Cincinnati.

Ralph Harrington was recently made General Tire advertising manager, according to Mr. McQueen. Mr. Harrington has been a member of the advertising department since 1928 and previous to that time was engaged in sales promotion work.

At the same time it was announced that the company's advertising appropriation for the current year is larger than that of any previous year in its history.

General Opens Mechanical Goods Plant

Operations at the newly opened plant of the mechanical goods division of The General Tire & Rubber Co. at Wabash, Ind., are rapidly gaining momentum, and by the first of the year it is expected that the present operating force of approximately 175 will be tripled, according to W. O'Neil, president of General Tire. When completely equipped and in full operation, the plant, consisting of 15 departments, is expected to employ around 1,000 persons and will be one of the most complete and modern in the country. Its yearly production volume is expected to total $5,000,000, covering 5,000 different articles for the automotive, refrigeration, and allied industries.

In the past few years the amount of rubber, exclusive of tires, in the average automobile has increased from about five to more than 40 pounds. Automobile companies today are the largest single users of mechanical rubber goods.

Installation of machinery is still being made although the plant has been operating on a limited scale the past several months. The first rubber products were produced in the Wabash plant experimentally on March 8, 1937. The brick and steel construction buildings with 228,669 square feet of gross floor area are located on a 30-acre tract of land adjacent to the Wabash railroad, which affords excellent shipping facilities with overnight service to midwestern industrial points.

According to Howard M. Dodge, general manager at Wabash, General Tire is doing extensive development work on a new method for adhesion of rubber to other materials which will tend to expand the use of rubber in machine design. The vibration damping qualities of rubber make this objective highly desirable. This new method eliminates the old method of brass plating and is expected to be of great value in the future.

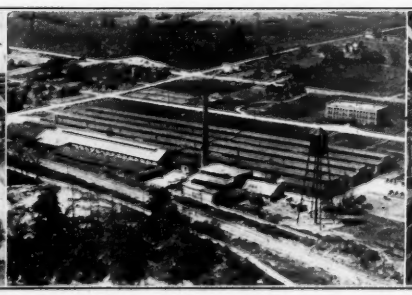
Other contemplated products include rubber rolls for printing presses and rubber drums for the transportation and storage of hydrofluoric and other metal-attacking acids.

Eventually the company expects to take up the production of various novelties such as toys, play balls, and similar items distributed through premium and syndicate outlets.

With the extensive research organizations at Akron and at Wabash, General expects to play an important part in the development of synthetic materials and to enter the plastic field in which there has been much activity.

In the rubber industry, as a whole, the sales volume of mechanical rubber

Equipment to Vulcanize Acid Drums



General Tire Mechanicals Plant at Wabash

Press Room

goods accounts for 21.4% of the total sales in the industry this year, according to the Rubber Manufacturers' Association. This marks an increase from 19.8% during the same period in 1936; while in 1934 the sales volume of mechanical rubber goods amounted to only 16.2% of that of the industry as a whole.

O'Neil Aviation Trophy

For the first time boy model plane builders at this year's National Model Aircraft meet at Detroit, Mich., not only competed in building model aircraft to scale, but actually flew the models in competition for the trophy offered by William O'Neil, General Tire president. Flying the scale model he had built, Leo Bailey, 17, of Akron, won the contest and the trophy, which is endowed with a gasoline airplane engine to encourage the builders of scale model planes to progress into the powered model airplane class. Each year the gasoline engines become the property of the boys winning the trophy; while the trophy itself is passed on each year to succeeding winners and at the end of five years it becomes the property of the National Aeronautical Association at Washington. The winner kept his scale model plane, propelled only by a rubber band, in the air 31 seconds.

The flying scale model event was introduced at the Detroit meet this year through the efforts of Mrs. Ray W. Brown, president of the Akron Women's chapter of the National Aeronautical Association, chairman of the women's organization committee of the N.A.A., and wife of the aeronautical tire sales manager of the General Tire company and pilot of the General Tire Lockheed Vega, "Miss Streamline."

Goodyear News

The Goodyear Tire & Rubber Co., Akron, recently announced several important executive changes affecting the sales department.

J. E. Mayl, assistant sales manager with headquarters in Akron, was appointed vice president of the California company with headquarters in Los Angeles. As such he heads the operating committee of that company.

W. A. Hazlett, western division sales manager, with headquarters in Los Angeles, became managing director of Goodyear, England, with headquarters in Wolverhampton.

H. E. Blythe, assistant sales manager in charge of retail sales, was made sales manager of the tire department in direct charge of wholesale and retail tire sales. His headquarters continue in Akron.

C. C. Osmun, southeastern division sales manager, became merchandising manager, tire sales department. In this position he reports to Mr Blythe.

Mr. Osmun's successor in the southeastern division is L. H. Shepherd, who had charge of sales in the New York, N. Y., district.

J. K. Hough, managing director of the English company, returns to Akron as advertising manager.

H. G. Harper will accompany Mr. Mayl to California as manager of the western division. Mr. Harper had been manager of the advertising department.

Upon the return of Mr. Hough from England, L. E. Judd, who has divided his time between direction of advertising and public relations, will devote his full attention to the position of director of public relations, reporting to the executive committee.

Expansion and reorganization of the sales personnel department into the sales and office personnel department, with augmented functions and several additional staff people, was announced by Charles E. Cannon, manager, at a dinner attended by those in that department. The department will handle all phases of personnel work for the sales and office organizations, to improve service.

An excursion to New York, N. Y., is being arranged for Goodyear employes, to leave Akron on September 30 and New York, October 3. Fred Colley, head of Employes' Activities, is head of the general committee in charge of the trip.

The United Rubber Workers of America, a C. I. O. affiliate, won exclusive bargaining rights at the Goodyear plant in Akron in an election completed August 25 by the National Labor Relations Board. The vote was announced as: for the U. R. W. A., 8,464; against, 3,193.

New Automobile Heater

The new Goodyear automobile heaters for 1938 have been designed to combine beauty of appearance in keeping with the interior refinements of modern cars, increased heating capacity, and other improvements. Incorporated in the "Double Eagle" and "All-Weather" models are these outstanding new features: (1) more efficient defrosting than ever before; (2) two new foot warmers, one for the driver and one for the front seat passenger; (3) new method of heat distribution.

The new defrosting feature is built into the heater, operates automatically, connects to defroster outlets on new cars, and works on all cars. In excess of 1,000 cubic feet of heated air per minute can be forced to the windshield with no extra motor or blower needed.

The new method of heat distribution is responsible not only for the defrosting and foot warming features, but for greater heating efficiency throughout the car. An entirely new principle of heat transfer and air distribution has been conceived, which makes possible much greater heating efficiency. With this new principle, heated air is drawn through the radiator and forcibly distributed to the defroster, to foot warmers, and the car interior.

Besides the three outstanding features, there is also a new and more efficient radiator, fan and motor—all either enlarged or improved to coincide with the engineering of the heater as a whole.

Goodrich Activities

Chester T. "Chet" Morledge, with Goodrich since June, 1936, has been made assistant manager of The B. F. Goodrich Co., automobile tire department, according to W. C. Behoteguy, tire sales department head. Mr. Morledge's first connection with the rubber business, in 1920, was with the American Rubber & Tire Co., Akron, where he served in practically all departments, became assistant superintendent, and finally assistant sales manager before he joined the India company in 1926 as a salesman. There he was made assistant sales manager in 1927, sales manager in 1930, and vice president in charge of sales in January, 1934.

A. R. Bowlzer, sales promotion manager of the Denver district, has been transferred to Akron as an assistant manager of sales promotion, announced P. C. Handerson, director of advertising and publicity. Mr. Bowlzer, a graduate of the University of Southern California, joined Goodrich in March, 1932, as a tire adjuster in the Los Angeles factory. He was appointed sales promotion manager of the Denver district in May, 1933.

Goodrich has announced the appointment of three new representatives who will devote their efforts exclusively to the sale of Koroseal materials to the textile industry. A. F. Fentress will call on the textile trade in Georgia, Alabama, Mississippi, and Tennessee. He will maintain headquarters in Atlanta; J. O. Cole has been assigned to North Carolina, South Carolina, and Virginia, with headquarters at Greenville, S. C., and F. W. Long will have charge of sales in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont and will have headquarters in West Newton, Mass.

Frank E. Titus, assistant sales manager of the Goodrich company in charge of its West Coast sales activities, completed 30 years of company service in August. Two other members of the Pacific Goodrich organization, F. A. Nied, general superintendent, and L. E. Nollan, department manager, have also been with Goodrich 30 years.

Paul Dietz, Goodrich general manager in China, preferred to remain in Shanghai and take his place as a member of the city defense force rather than be transferred to the security of Manila, P. I., he advised Goodrich officials in Akron. Mr. Dietz, 34, has lived in Shanghai for the past five years where he is a director of the American Chamber of Commerce and a vice president of the American Club.

"Reasonably safe," he cabled.

When N. M. Andrews, of Moulmein, Burma, forwarded pictures and details of the discovery in the Andaman Sea of the wheel, tire, and landing gear of the airplane of Captain Charles Kings-

(*Continued on page* 81)

NEW ENGLAND

IN NEW ENGLAND the business recession has definitely set in. Textile operations are lower, and crops need more rain. Shoe production was curtailed, resulting from slow sales following large advance buying early in the season and resistance to prices.

According to recent statistics of the State Director of Labor, employment in 288 manufacturing establishments in Rhode Island during June increased 10% from that of June, 1936; but the eight concerns affiliated with the rubber manufacturing industry showed a loss of 11.5% as compared with the previous June's, although only a loss of 9.7% from those of May, 1937. The number of persons employed by these concerns was 3,693 in June, 1937, against 4,175 a year ago; 4,088 in May, 1937, and 4,028 in April. Payrolls for these rubber manufacturing concerns amounted to $280,000 this year June as compared with $234,000 in June, 1936; $280,000 in May, 1937, and $299,000 in April. During June 1,546,000 kilowatt hours of electric power were consumed by rubber concerns, 10.5% increase over June a year ago, although 20.1% less than in May this year, when 1,934,000 kilowatt hours were consumed. In April the consumption was 2,234 kilowatt hours and in June, 1936, 1,399,000.

Twenty-one corporations affiliated or identified with the rubber manufacturing industry of Rhode Island are taxed on a corporate excess that amounts to $19,573,080.56, upon which taxes totaling $78,242.26 are levied this year, according to the annual statement of the Division of State Taxation filed with the General Treasurer for collection. The total corporation revenues for the state attained their highest peak in seven years, soaring to $1,695,792.43, an increase of $234,200.68 over the 1936 returns. Better business conditions and a revaluation of ratable corporate values are held responsible for the gain. The general increase is indicated by the fact that 464 companies pay taxes this year on corporate excess of $100,000 or more. In 1936 the list included 392 that paid on $100,000 or more excess; in 1935 there were 353; in 1934, 337, and in 1933, 315.

Phillips-Baker Plant Sold

At public auction on August 20, the Goodyear Footwear Corp., a Delaware company, purchased the plant of the Phillips-Baker Rubber Co., on Warren, Westfield, Fuller, and Harrison Sts., Providence, R. I. The price paid at public auction was $225,000. Included in the sale were all real estate, machinery and other equipment, patents, trade marks, and trade names. The real estate was valued at $120,440 for tax purposes in 1936 and tangible personal property was assessed at $251,000. Of the latter, however, finished and unfinished stock at the plant were not included in the sale. Neither were the name "Phillips-Baker Rubber Co." nor the customers' lists of the old firm sold. The real estate of the plant comprises approximately 63,938 square feet of land.

What disposition the Goodyear concern will make of the property was not revealed by James A. O'Hearn, of New York, who represented the purchasing corporation at the auction. The Phillips-Baker Co. employed about 1,000 persons before it was closed because of a C.I.O. strike in April after which the plant was not operated. Subsequently the stockholders voted to liquidate.

The Goodyear Footwear Corp. won out in a three-sided bidding contest. The other bidders were a New Yorker who usually represents Michael Flynn, of New York, speculator in industrial properties; and Joseph Albert, of Trenton, N. J., one of the largest dealers in rubber machinery and plants in the country. Nearly 100 persons attended the auction, which was conducted by Addison Freeman, of Samuel T. Freeman & Co., Boston, which was acting for the Henry W. Cooke Co., of Providence.

Rubber Technician

Emil William Schwartz, engineer in charge of the works laboratory of General Electric Co. at Bridgeport, Conn., joined the organization in 1923 as chief chemist and rubber technician. Previously he had been employed in the laboratories of Handy & Harmon (1921-1922) and of Butterworth Judson Corp. (1919-1920).

Mr. Schwartz was born in Bridgeport, Conn., July 25, 1897. He was graduated from Bridgeport High School in 1915 and from Sheffield Scientific School, Yale University, in 1919 with the degree of Bachelor of Philosophy in chemistry.

He is a member of the American Society for Testing Materials, Chamber of Commerce, American Chemical Society and its New York Group, serving on the latter's executive committee several terms. In June, 1934, GE conferred upon Mr. Schwartz the Charles A. Coffin Award of Achievement, and he received the medal, cash, and an engraved scroll. As his hobbies, he mentions tennis and flower gardening.

He is married and lives at 345 Lake Ave., Bridgeport.

E. W. Schwartz

Black Rock Mfg. Co., manufacturer of rubber machinery, Bridgeport, Conn., has announced that C. O. Konrad, long the firm's representative in Ohio and western Pennsylvania, has severed this connection, and his territory has been taken over by J. C. Clinefelter, 239 No. Highland Ave., Akron, O. Mr. Clinefelter, however, will continue also as representative for John Royle & Sons, Paterson, N. J.

United Raincoat Co., manufacturer of raincoats, hunting coats, and similar products, Framingham, Mass., recently leased, it is reported, manufacturing space in the Logan factory, Hudson, Mass. This newly organized firm made the move to expand its operations. The company will start with about 20 employes and increase this number as necessary. George Freedman is company president.

Frank W. Gorse Co., manufacturer of rubber thread, Central Falls, R. I., employes held their second annual outing on August 7 at Rocky Point, R. I. Shore and chicken dinners were served after which a program of sports was run off, with prizes in each event.

Merrimac Chemical Co., Everett, Boston, Mass., subsidiary of Monsanto Chemical Co., St. Louis, Mo., is constructing a 40- by 94-foot third story addition to its office building to be used by the sales and accounting departments.

Naugatuck Chemical Outing

Camps Pershing and Irving on the Housatonic River, Shelton, Conn., were the scene of the third annual picnic of the Alembic Association of Naugatuck Chemical on Saturday, August 21, 1937. Employes, factory officials, guests and their families totaling approximately 1,200 spent an enjoyable day swimming, dancing, taking part in athletic contests and participating in the well-rounded program which Chairman A. J. Daly had prepared. Factory Manager John E. Caskey made a brief

(*Continued on page 76*)

NEW JERSEY

PRODUCTION in the rubber plants in New Jersey is holding up very well with some manufacturers reporting that business has shown a little increase during the month. There is a heavy demand for jar rings this year and the demand for hose is also good. Hard rubber manufacturers report an increase in orders for various products, especially radio parts.

The Mercer County Rubber Workers' Council was recently organized at Trenton and is composed of eight locals of rubber workers. The council will adopt a platform of standard wages and better working conditions to be inserted in the new agreement which, according to reports, will be requested from plant officials when the old agreement expires. Employes of Thermoid, Pocono, Puritan, Acme, Joseph Stokes, Luzerne, Vulcanized, and Sloane-Blabon Corp., comprise the locals with a membership of about 4,000.

United Rubber Workers of America, with two hundred and fifty delegates of 45 locals in attendance, ended a conference in Trenton recently to prepare resolutions and suggestions to be submitted at the national convention in September. The States represented were Connecticut, Massachusetts, Rhode Island, New York, Delaware, Pennsylvania, and New Jersey. Sherman H. Dalrymple, international president of the United Rubber Workers, addressed the gathering.

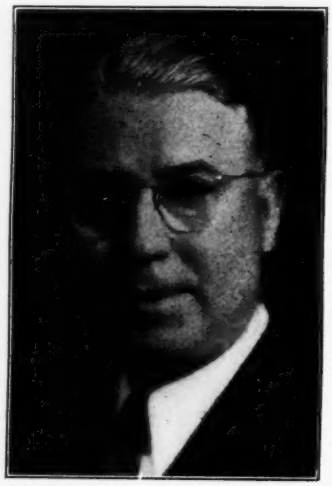
Charles E. Stokes, president of the Home Rubber Co., Trenton, and Mrs. Stokes have been spending some time at Skytop in the Pocono Mountains.

Mercer Rubber Co., Hamilton Square, reports that business has shown an increase during the first six months of this year over the same period last year.

Company President

Harry William Roberts is a native of Akron, O., where he was born January 31, 1882. After attending grammar school and night school in Akron he was employed by the Faultless Rubber Co. in that city. In 1903 he organized the Up-River Rubber Co., Yonkers, N. Y., which in 1910 merged with the Silver Truss Co. Beginning in 1915 Mr. Roberts traveled for four years for Robert J. Pierce, Inc., a druggists' sundries concern in New York. In 1918 he took an interest in this company's factory in Trenton and in 1922 incorporated the Pierce-Roberts Rubber Co. of which he became and still is president.

Mr. Roberts is a member of the Shrine, Kiwanis Club, and Trenton Country Club as well as a director of



Blank & Stoller

H. W. Roberts

the Trent Building & Loan Association. He takes a very active interest in the Chamber of Commerce activities. Being unmarried, he finds ample time to indulge in his hobbies of golf and fishing. His home address is 33 S. Dean Ave., Trenton, N. J.

Rubber Compounder

Kenneth J. Soule, chief compounder for the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., was born in Ottumwa, Iowa, May 16, 1894. After receiving a B.S. in chemistry (1916) at the University of Washington in Seattle, he immediately started his career as a rubber technician with the Goodyear Tire & Rubber Co. at Akron and New Toronto, Ont. In 1918 and 1919 Mr.

(*Continued on page* 78)

Blank & Stoller

K. J. Soule

MIDWEST

BUSINESS conditions in the Midwest are spotty. One district reports a shortage of skilled labor; and relief rolls are being steadily reduced. Advances in zinc prices have spurred activity in the mineral section. Automobile production picked up somewhat after vacations ended at some plants, but decreased activity is again expected until the new models get under way. The demand, however, for used cars recently improved.

Monsanto Chemical Co., St. Louis, Mo., on July 22 elected as vice president R. J. Hawn, a director of manufacture with several Monsanto plants under his supervision. He had been a vice president of Swann Chemical Co. prior to its absorption by Monsanto in 1935.

Eagle-Picher Sales Co., Cincinnati, O., on July 24 moved several of its Chicago, Ill., sales offices from 4401 S. Western Ave. to One La Salle St., Room 3226, according to W. R. Dice, executive vice president. The divisions changing address were the Pigment & Oxide Division, the Lead-in-Oil Division, and the Insulation Division. The Metal Division remains at 4401 S. Western Ave.

Graham Paige Motors Corp., Detroit, Mich., is now manufacturing the new Graham-Bradley tractor on a separate assembly line in its own plant and will market it principally through Sears, Roebuck & Co.'s retail stores in the Midwest. The tractor is designed to handle the various farm implements made by the David Bradley Mfg. Works, Sears subsidiary. The Graham-Bradley tractor is engineered for pneumatic tire equipment. Rear tires are 36 by 9.00 penumatics, carrying 28 pounds of air pressure and, if needed for extra traction, 250 pounds of water. Front tires are 16 by 5.50.

Safety Congress

The twenty-sixth annual national safety congress and exposition will be held in Kansas City, Mo., October 11 to 15, by the National Safety Council, Inc., 20 N. Wacker Dr., Chicago, Ill. The Rubber Section will hold its session Thursday afternoon, October 14, in Room 205, Municipal Auditorium. The program is scheduled as follows:

2:00. Opening remarks by General Chairman J. M. Kerrigan.

2:10. The 1937 Rubber Section Safety Contest: (a) Outstanding facts, General Chairman J. M. Kerrigan; (b) Presentation of awards.

2:25. Election of officers.

2:30. Rubber Industry Problems (round table discussion): (a) What Is

(*Continued on page* 90)

Rubber Industry in Europe

GREAT BRITAIN

I.R.R.C. Criticized

The personnel of the International Rubber Regulation Committee and the question of the renewal of the restriction scheme, which expires December 31, 1938, are receiving considerable discussion at present. In a recent issue of the London *Rubber Age,* F. J. Tompsett, chairman of the Rubber Shareholders' Association, set forth his views on these matters, views which appear to be shared by many interested in rubber and considered authorities. While admitting the benefits of the scheme, Mr. Tompsett fears that its renewal will lead to the loss of independence by the rubber industry and to many abuses and weaknesses, particularly because of the preponderance of civil servants on the committee and the influence of the Americans. The committee now consists of 14 members, the majority of whom are civil servants. Shareholders as such are not represented, or is the London Rubber Trade Association directly represented. On the other hand it is asserted that the consulting panel of three members attached to the committee represents mainly American interests whose views, it is claimed, carry more weight with the committee than those of producers. Civil servants, it is bluntly stated, consult their own interests first and would make all efforts to continue the scheme to retain their jobs. Many directors would also like to have the restriction scheme continued as thereby much responsibility would be lifted from their shoulders. But the result of all this action would be that the rubber industry would end by coming under the heel of a permanent bureaucracy.

The committee is accused of doing all in its power to keep prices down mainly to benefit American tire manufacturers. With present costs, shareholders believe, the price of rubber should be between 1s. and 1s. 2d. per pound to give investors 12½% on their capital, which the R.G.A. considers a fair return because of the fact that rubber is a wasting asset. Mr. Tompsett states that "a large body of public opinion holds the view that the I.R.R.C. has shown a deplorable lack of courage and competency in not being able to combat successfully the operations of the American manufacturers."

Then he adds, "Should it therefore be decided that a continuance of the Scheme for another short term of years is desirable in the interests of the industry as a whole, then it should be an integral condition of its maintenance that its constitution should be revised on the lines herein indicated."

The Evening Standard represents substantially the same opinions as those expressed above.

Research Association of British Rubber Manufacturers

The seventeenth annual general meeting of the Research Association of British Rubber Manufacturers took place in London on July 21 at a well-attended function with a number of prominent persons present including Sir John Campbell, chairman of the International Rubber Regulation Committee, Otto Friedrich, of the German committee, A. L. Viles, president of The Rubber Manufacturers' Association, Inc., New York, and Dr. van Rossem, representing the rubber industry in Holland. On this occasion Brig. Gen. Sir Harold B. Hartly was elected president of the association for the ensuing year. The former vice presidents, H. Berry, H. H. Burton, Lt.-Col. J. Sealy-Clarke, H. Evans, W. J. Gallagher, T. H. Hewlett, H. Eric Miller, J. Hancock Nunn, F. Pegler, J. A. Redfern, F. H. Sprang, and J. H. Mandelberg, were reelected, the only new one being S. T. Rowe, president of the Institution of the Rubber Industry.

Notes

The Right Hon. L. S. Amery, P.C., M.P., has been appointed a director of the Goodyear Tire & Rubber Co., (Great Britain), Ltd.

Leyland metal-framed bus bodies are to have rubber mudguards as standard equipment for front and rear wheels.

Flat Japonette is a new rubber paint for walls and interior decoration. It is produced in delicate, but non-fading colors said to be able to withstand repeated washing without injury. These coatings, it is claimed, have excellent covering power and are produced by Blundell Spence & Co., Ltd.

The Rubber Growers' Association has had attractive stands at various agricultural shows of late when it exhibited a variety of novel applications of rubber. One such was a new nesting box designed to avoid breakage of eggs and to prevent them from becoming fouled in the nest box. The nesting surface of these boxes is of suitably shaped rubber sheeting which has a hole provided with a tongue of rubber that permits the egg to slide safely into a lower part of the box. Other articles that attracted attention were pneumatic saddles and collars for horses, rubber-jointed track for Ransome cultivators, calf feeders with rubber teats, etc.

A new type of fitting for sliding doors in which rubber plays an important part was recently put on the market by Silent Gliding Doors, Ltd., London. This fitting comprises a U-section steel channel having a hardwood former inside, which in turn is surrounded with rubber on top, sides, and most of the bottom. The upper (rubber) surface is flush with the floor. When the roller travels along the track, it depresses the rubber into the grooved top of the wooden section which guides the roller. When the roller has passed, the rubber regains its original position, giving a flush floor again. This arrangement not only gives silent movement, but is free of the objections to the usual types of sliding systems for doors. The latter are either fixed on top of the floor, when they easily trip the careless, or are sunk into the floor, when they catch grit and consequently give a jerky motion instead of a smooth slide. The new system is flush with the floor and avoids both objections.

SWEDEN

In 1936 Sweden imported 4,659,000 kilos of crude rubber, balata, and gutta percha, besides 486,820 kilos of ebonite dust, waste, and reclaimed rubber. At the same time she imported rubber manufactures amounting to 3,658,974 kilos, value 11,208,714 krone, chief among which were automobile tires, 1,444,342 kilos; other tires, 204,746 kilos; automobile tubes, 78,761 kilos; other inner tubes, 294,987 kilos; hose, 105,706 kilos; belting, 405,535 kilos; and matting, 85,157 kilos. While the Swedish rubber industry produces chiefly rubber footwear and exports fair quantities, the 1936 imports also included 50,075 kilos rubber shoes and galoshes and 129,840 kilos rubber-soled shoes. Of the latter 59,877 kilos were from Japan. The exports of rubber shoes and galoshes totaled 458,332 kilos and of rubber-soled footwear 74,-141 kilos. Exports of other rubber manufactures amounted to 242,227 kilos, value 1,134,101 kroner, and included 49,210 kilos hose, 39,871 kilos automobile tires, 8,047 kilos solid tires, and 71,444 kilos heels and soles.

GERMANY

Rubber Covered Wood

A method has been developed for uniting hard rubber to wood so firmly that separation of the parts is impossible without damage to one or both of the parts. It is claimed that wood so protected has the virtues of both components: it has the light weight, elasticity, and poor heat conducting power of wood and is as easily worked; at the same time the defects of wood, its reaction to moisture, lack of resistance to chemical and mechanical influences, are eliminated or considerably reduced by the hard rubber layer. This hard-rubber covered wood is already being largely used in the textile industry and is also finding application in the electrical industry. The producers of this new material are Werkstatten fur Schutzgummierung von Eugen Sachs, Berlin-Weissensee.

New Rulings

Recently a number of new rulings have been issued for the rubber industry: first, in connection with the 100% duty on crude rubber, manufacturers of cycle tires and tubes are permitted to raise their prices to cover this duty, and dealers may pass on the increase to consumers.

After August 1, 1937 it is forbidden to use pneumatic tires on horsedrawn vehicles. This prohibition does not apply to retreaded tires or tires in use before the date of the order.

The duty on latex has been changed; by an order effective August 1, 1937, imports of latex are dutiable as follows: latex with a dry content of 46% and under, will pay 47 marks per quintal; with dry content of over 46% and up to 66%, 71 marks; over 66% and up to 81%, 89 marks.

Imports and Exports

When the 100% import duty on crude rubber was introduced in May, 1937, there was a great deal of speculation as to the probable effect on consumption. Statistics for May and June, 1937, show a marked decrease in imports as compared with April, 1937, but the figures continue to be considerably above those for the corresponding months of 1936. Thus the imports of April, 1937, were 88,444 quintals, for May, 1937, 68,298 quintals, and for June, 1937, 65,881 quintals. But the imports in May, 1936, were only 47,439 quintals and for June, 1936, 58,122 quintals. For the first half of 1937 imports of crude rubber came to 452,666 quintals; whereas for the first half of 1936 they totaled 320,528 quintals.

During the half year period of 1937 Germany also imported rubber manufactures amounting to 68,679 quintals, against only 7,518 quintals in the first six months of 1936. The very considerable increase was accounted for by imports of worn tires. Exports during the same period also rose, and were 97,047 quintals against 74,986 quintals.

"Thiokol"

"Thiokol" A, for some time imported into Germany from America, is now being produced by the Thiokol Gesellschaft m.b.H., in Saarau, Kreis Schweidnitz. This company is connected with the Rutgerswerke A.G. and the Silesia, Verein Chemischer Fabriken, Saarau.

Chlorinated Rubber

Consolidirte Alkaliwerke, Westeregeln, Bez. Magdeburg, recently patented a process for producing chlorinated rubber direct from latex.[1] According to this method, the latex, before it is chlorinated, is treated with organic solvents having a higher boiling point than water, for instance the halogen derivatives of naphthaline, benzol, etc., till it is practically free from water. Treatment takes place at elevated temperatures, above or under 100°, according to the type of solvent; the concentration of the final rubber solution depends on the amount of solution employed. It is claimed that this method eliminates the danger of corrosion and coagulation which the presence of the water increased to an undesirable extent.

[1] D.R.P. 646,424.

EUROPEAN NOTES

The Matador Rubber Works, Praha, Czechoslovakia, closed its accounts for 1936 with another loss, 202,972 kronen against 231,900 kronen in 1935.

Norway's imports of crude rubber, gutta percha, and balata were 1,581 tons; automobile tires, 524 tons; cycle tires, 124 tons; inner tubes for automobiles, 46 tons, and for cycles, 59 tons. Exports from Norway included 228 tons of belting and 169 tons of footwear.

Footwear is the chief item of production of Latvia's three up-to-date factories although fair amounts of cycle tires and tubes are also manufactured. In 1936 the total output of these goods was 123,753 cycle tires, 138,686 inner tubes for cycles, 444,640 pairs of rubber overshoes. A large proportion of the footwear output has always been exported, but the depression caused a considerable reduction in this business. However, Latvia too is feeling the effects of improved business and was able to increase exports of footwear from 636,000 lats in 1935 to 1,031,000 lats in 1936.

NEW ENGLAND

(*Continued from page* 73)

speech of welcome over the public address system. The plant was closed for the occasion.

Many athletic contests were held, including races for men and women, a tug-of-war and the girls tested their skill at nail driving and rolling-pin throwing. A number of prizes were distributed to the winners of dancing contests.

A bathing beauty revue, demonstrating the latest in U. S. swim suits and clothing, was a hit of the affair and costumes of the "Gay Nineties" were also exhibited. Music was provided for entertainment and dancing throughout the afternoon. From all evidence those present enjoyed the outing even more than in previous years.

Andrew J. Daly was general chairman and had the following assistants; O. Larson and W. Miller (tickets), T. Lynch (refreshments), R. Hanson (sports), E. W. Valentine (transportation), J. J. Raytkwich (publicity), and L. J. Gunn (prizes). Officials for the contests were; P. Kelley (starter), E. A. Hermonat (scorer), G. P. Smith (announcer), and D. L. McCollum, P. E. Rice, G. A. Graham, J. C. Wendes (judges).

Jacob Kemer, of 164 Gallatin St., Providence, R. I., has filed statement with the City Clerk's office, Providence, that he is owner of the Rhode Island Insulated Wire Co., 1 Mashapaug St.

The Excelsior Automotive Wire & Cable Co., 32 Central Ave., Pawtucket, R. I., is owned by Milton C. Sapinsley, of 11 Gorton St., Providence, R. I., according to his statement filed with the City Clerk's office.

Carr-Fulflex, Inc. Arthur H. Carr, of Bristol, and former Lieutenant Governor James G. Connolly and Francis R. Foley, both of Pawtucket, recently had incorporated Carr-Fulflex, Inc., with headquarters at Bristol, at a capitalization of $250,000. The company is authorized to deal in rubber products. The Carr Co. now operates in Bristol, but it was stated that the incorporation papers were obtained for "new business enterprise." Explaining later, Mr. Carr declared that the company would be for selling purposes only. The Carr Co. makes a rubber thread called "Fulflex," and it is the firm's plan to publicize its trade name through the medium of the new company. Greater efforts will also be extended to increase the company's foreign trade through the new concern.

THE MAN WHO DOES THINGS MAKES many mistakes, but he never makes the biggest mistake of all—doing nothing.—*Poor Richard.*

Rubber Industry in Far East

NETHERLAND INDIA

Native Rubber Report

Individual restriction for natives, by enabling them to take better advantage of the improved prices for rubber, has led to a wave of prosperity among natives which cannot fail to influence general business in these parts. The population is spending its money usefully now, according to the Thirtieth Report on Native Rubber Cultivation for the first quarter of 1937. Bicycles to facilitate the transportation of rubber are being bought, and large numbers of rubber mangles; clothes are being replenished, and homes improved; debts are paid off, and marriages and feasts arranged, put off because of the depression, and so on.

The reports from the different districts show untapped gardens being tapped and cleared more or less extensively in various parts, including Atjeh, Tapanoeli, Djambi, Palembang, West Borneo, etc. As a result of increased tapping, there is a good deal of share tapping done besides the more usual family tapping. In share tapping the worker receives ½, ⅔, or ⅝ of the rubber he collects, depending on how productive the holdings are. At the prices prevailing in the first quarter of 1937 and in April tappers in various native gardens were able to make as high as 1 guilder per tapping day, and in some districts good tappers made 1 guilder to 1.25 guilders daily. Naturally this high pay is attracting labor from the interior to the rubber centers; in certain districts estates complain of desertion of coolies in large numbers, which tendency incidentally is to be expected in view of the difference in pay on estates and native gardens.

This greater tapping activity is also giving more work to smoke houses and remilling factories, everywhere reported working to capacity. Several new smoke houses and remilling factories are being set up, and in some districts there is also a demand for the extension of existing factories. The growing interest in preparing rubber in sheet form has led to quite a call for mangles, which in certain parts is so great that orders could not be filled even from Java and Singapore; consequently prices of mangles rose.

Despite the present interest in rubber, which is drawing people from the non-rubber districts, there is comparatively little tendency to neglect food crops or other crops. South and East Borneo was the only district from which it was reported that the influx to the rubber centers gave cause to fear that food crops might be affected.

Concentrating Latex

The Rubber Cultuur Mij. "Amsterdam" lately developed a new method of concentrating latex by creaming, which is claimed not only to require much less time, but to give a product with a higher dry rubber content than is possible with the usual creaming processes. The top layer of cream formed in the process of creaming is known to be the most highly concentrated, and the present method aims to get full benefit of this phenomenon.

It was found that if the latex, mixed with creaming agent, protective colloid, and anti-coagulant, is stirred in the usual manner and is led continuously and at a certain constant rate through fine openings into serum (separated from the latex in preceding creamings), then the difference in the specific gravity of the latex and the serum forces the latex mixture to rise up through the serum for a certain distance without mingling with it. Then the latex, forming a layer on top of the serum, immediately begins to cream. The distance the latex must travel through the serum may be varied, but should be preferably 5 cm. or more. Still more favorable results may be obtained by adding substances like soaps to the serums.

To render the process as efficient as possible a special type of creaming tank has been devised. It is of tubular form, fixed in a horizontal position, but at a slight angle (10 degrees), and the latex is allowed to flow slowly and continuously through it to a depth of 10 to 50 cm. The tank is provided with outlets and taps at either end; the serum is drawn off at one end and the cream at the opposite end.

To cream the latex by this process, it is first mixed with the creaming agent, etc., and fed through a pipe which communicates with a drum perforated on top and is situated at that end of the tank toward which the serum is made to flow and later drawn off. Through these perforations the latex passes from the drum into the serum above without mingling with it, and after a little distance rises to the top of the serum, when as already explained, creaming immediately begins. The latex now slowly and continuously flows into the creaming-tank proper, in an upward direction (due to the slight slope), and as the cream slowly rises along one side of the tank, it becomes more and more concentrated until it reaches maximum concentration at the end of the tank where it is continuously drawn off. Meanwhile the separating serum has been flowing along the other side of the tank toward the opposite end, where it too is continuously drawn off. To insure better separation of cream and serum suitably placed partitions may be in the tank.

It is claimed that with this process it is possible to get a cream with a dry rubber content of 60% if the latex is allowed to pass through the tank in six to 8 hours, and a cream of 64% and more is easily obtained if the passage through the tank is prolonged for 12 to 24 hours. An additional advantage is that the rapid separation of the latex into two layers permits a reduction in the amount of ammonia or other preservative used and consequently decreases the loss of preservative in the serum.

New Native Rubber Factory

A new rubber factory established by a native cooperative society in Sadeng, district Leuwiliang (Buitenzorg, Java), was opened July 10. Much interest was shown by high Dutch officials present at the opening of this factory, which, incidentally, is the first of a number that it is planned to erect, and various speeches were made by them in which the natives were assured of support by the government and advice was promised in case of difficulties.

Rubber Exports

The Central Bureau of Statistics has issued preliminary figures indicating that exports of estate rubber from Netherland India in June, 1937, amounted to 23,242 tons, which brings the total exports of estate rubber for the first half of 1937 to 105,087 tons. This shows a shortage of 2.119 tons against quota, but the difference is amply covered as 4,700 tons have been placed under customs control for which extra export coupons, valid till August 31, 1937, are available.

The native rubber shipments for June, 1937, came to 24,647 tons so that the total for the first half of 1937 was 107,013 tons, or 7,743 tons above quota. The high figure for native shipments in June is ascribed to the advance issue of export licenses for the third quarter of this year, which was begun at the end of May, so that some June shipments were made on these licenses. Stocks of native rubber in the hands of exporters in the Outer Provinces came to 12,561 tons at the end of June.

INDIA

Increasing local manufacture of rubber footwear and rubber-soled canvas shoes has led to a marked reduction in the imports of these goods. In the fiscal year ended March, 1937, imports of rubber-soled canvas shoes came to 1,135,679 pairs, value 730,000 rupees, against 2,049,526 pairs, value 1,260,000 rupees, in the preceding year. All-rubber shoes totaled only 110,182 pairs, value 60,000 rupees, against 383,920 pairs, value 190,000 rupees. As most of these goods came from Japan, she accordingly was the chief loser.

Purchases of foreign automobile tires increased in the period under review, 290,498 units, value 13,220,000 rupees, against 280,866 units, value 12,620,000 rupees. Motor cycle tires, however, fell from 3,178 units, value 40,000 rupees, to 2,947 units, value 37,000 rupees. Figures for pneumatic tires for cycles were practically the same as in 1935-36 when imports were 1,819,066 units, value 2,300,000 rupees.

Most of this tire business is in the hands of the United Kingdom. Germany has improved her business in automobile tires; while the United States lost some ground here.

SOUTH CHINA

The Malaya Keng Chew Hoay Kuan, a Hainanese organization interested in land development, some time ago sent representatives to China to investigate the possibility of acquiring lands suitable for tropical agriculture. The firm purchased 10,000 acres of land in the Buan Ling district, South China, where it is planned to grow rubber and cocoanuts in the near future.

INDO-CHINA

Crude rubber exports from Indo-China continue to increase, but so far in 1937 the rate of increase is lower than from 1935 to 1936. Up to May, 1937, the shipments totaled 14,060 tons, 1,484 tons more than in the same period of 1936. For all of 1936, exports amounted to about 42,000 metric tons, against 20,000 metric tons in 1935. However total shipments for 1937 are expected to reach about 50,000 tons.

MALAYA

In its April circular the Prang Besar Rubber Estate gives remarkable figures of yields obtained from young experimental areas of high-grade seedlings. These seedlings have been grown from hand-pollinated crosses between different Prang Besar clones. One of these plots, 1.92 acres in extent and having at December, 1936, 121 trees per acre in tapping, yielded 658.6 pounds of rubber per acre in the four months September to December 1936, when the trees were 7¼ to 8¼ years old. This figure works out at roughly 2,000 pounds per acre per annum—a truly remarkable achievement for such young trees. For the whole of 1935, when the trees were only 6¼ to 7¼ years old, the output per acre was 1,037.5 pounds.

A similar plot of 3.46 acres, also having 121 trees per acre in tapping at the end of December, gave what appears to be still better results, for though a year younger than the first plot, it gave a yield per acre for the last four months of 1936 of 525.4 pounds, or at the rate of over 1,500 pounds a year. The yield per acre for the entire year 1935, when the trees were only 5¼ to 6¼ years old, was 899.3 pounds.

Prang Besar has established isolated seed gardens where seed from a number of mixed clones has been planted. These gardens are isolated from other rubber by six miles of cocoanut. It will be another year or two before they can be tapped on a commercial scale, but the above yields obtained from seedlings from clonal seed appear to justify the high expectations entertained for the isolated seed gardens.

NEW JERSEY

(*Continued from page* 74)

Soule took time out to join the Gas Defense Division of the U. S. Army. In 1919 he joined Raybestos-Manhattan as analyst, then stepping up through compounder, assistant chief chemist to chief compounder, the position he is filling today. While at Goodyear and at present Mr. Soule finds considerable interest in the factory training courses.

Mr. Soule belongs to the American Chemical Society and is active in the New York Group. He is also a member of Phi Beta Kappa and Phi Lambda Upsilon. Among his hobbies are golf and stamp collecting. He is married, has one daughter, and resides at 437 Morningside Rd., Ridgewood, N. J.

Puritan Rubber Co., Trenton, has installed new equipment and after completing two additions and making other improvements will be ready for a 100% fall and winter production. A contract has been let for a one-story addition to its plant on Perrine Ave.

Hamilton Rubber Co., Trenton, had a fire recently which damaged their dust accumulator building and gave the firemen a two-hour battle.

Air Cruisers, Inc., Clifton, recently received from the United States government a contract for $11,220 worth of balloons through the Department of Agriculture. The contract is for delivery at an indefinite date

CANADA

Under a Canadian order in council effective from June 26, 1937, to July 1, 1939, the duty has been reduced from 40% to 15% ad valorem on imports from the United States of "woven cord tire fabric, wholly or in chief part by weight of artificial silk or similar synthetic fibers, not to contain silk nor wool, coated with a rubber composition, when imported by manufacturers of rubber to be incorporated by them in pneumatic tires," according to a recent report from Assistant Commercial Attaché Oliver B. North, Ottawa. The general rate under the new item (Tariff No. 825) is 25% ad valorem (formerly 50%) and free under the British preferential (formerly 30%).

Alexander Hay, agricultural liaison officer of the Rubber Growers' Association, Inc., London, sailed August 7 for England after having been in Canada and the United States on a three-month visit. His purpose was to promote the use of rubber, primarily in connection with agricultural activities. Much progress has been made in the application of rubber products to farm equipment.

Shipments of Crude Rubber from Producing Countries

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam	French Indo-China	Total	Philippines and Oceania	Africa	South American	Mexican Guayule	Grand Total
1934	467,400	379,400	79,100	6,500	6,300	11,100	17,600	17,700	19,600	1,004,700	1,400	3,500	9,100	400	1,019,100
1935	417,000	282,900	54,300	9,100	4,900	8,900	19,300	28,300	28,700	853,400	1,500	5,000	12,200	500	872,600
1936	353,667	309,641	49,685	8,648	5,859	8,177	21,013	34,578	40,769	832,037	1,619*	6,122	14,632	1,228	855,638
1937															
Jan.	24,746	27,132	4,514	487	579	1,234	4,015	3,849	2,827	69,383	80	635	1,286	160	71,544
Feb.	24,138	26,770	5,603	1,033	843	780	2,015	3,554	3,077	67,823	180	537	1,789	206	70,535
Mar.	40,138	40,929	7,049	885	1,149	1,239	1,425	3,873	3,173	99,860	181	472	1,792	136	102,441
Apr.	41,696	33,136	3,419	627	559	783	2,960	1,899	2,095	87,174	200*	574	1,546	190	89,684
May	33,929	38,549	4,612	445	562	778	742	2,238	2,888	87,743	200*	600*	1,057	175	86,775
June	31,376	47,123	5,153	669	430	813	1,890	2,933	3,669	94,056	200*	600*	915	200*	95,971

*Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Patents and Trade Marks

MACHINERY

United States

2,085,228. **Apparatus for Filling Golf Ball Cores.** J. M. Oldham, assignor to L. A. Young, both of Detroit, Mich.

2,085,650. **Tire Buffing Stand.** E. M. Godfrey, Jr., Knoxville, Tenn.

2,086,481. **Latex Garment Form.** A. N. Spanel, Rochester, N. Y.

2,086,616. **Apparatus for Making Rubber Thread.** M. E. Hansen, Akron, and C. L. Beal, Cuyahoga Falls, assignors to American Anode, Inc., Akron, all in O.

2,087,304. **Tire Supporting Stand.** M. B. Sawyer, Los Angeles, Calif.

2,088,026. **Vulcanizer.** R. G. Daniel, Beverly Hills, Calif.

2,088,130. **Tire Retreader.** L. B. Broering and F. E. Kite, Los Angeles, Calif., assignors to Kite Mold Co., a corporation of California.

Dominion of Canada

366,653. **Vulcanizer.** Boston Woven Hose & Rubber Co., Cambridge, assignee of J. M. Bierer, Newton, both in Mass., U. S. A.

366,675. **Molding Apparatus.** I. B. Kleinert Rubber Co., New York, assignee of G. K. Guinzberg, Chappaqua, both in N. Y., U. S. A., assignee of P. Hansen, formerly of Hamburg, Germany.

366,686. **Rubber Threader.** Societe Internationale de Participations Industrielles et Commerciales, Luxemburg, assignee of W. M. Spencer, New York, N. Y., U. S. A.

367,327. **Floor Coverer.** Baldwin Rubber Co., assignee of H. M. Pryale, S. C. Clark, and W. S. Vrooman, coinventors, all of Pontiac, Mich., U. S. A.

United Kingdom

461,060. **Display Apparatus.** A. W. Wood.

461,137. **Dipping Mold.** International Latex Processes, Ltd., E. A. Murphy, G. W. Trobridge, and J. A. Andrews.

461,216. **Latex Concentrator.** Metallges. Akt.-Ges.

461,263. **Mold for Cutting Shapes.** O. Kremmling.

461,815. **Vulcanizer.** K. B. Kilborn.

462,120. **Taping Machines.** British United Shoe Machinery Co., Ltd., E. H. Simms, and J. W. Pratt.

Germany

647,732. **Rubber Strip Producer.** International Latex Process, Ltd., St. Peter's Port, Channel Islands, and F. Gabor, Budapest, Hungary. Represented by R. and M. M. Wirth, and C. Weihe, all of Frankfurt a. M., and T. R. Koehnhorn and P. Wirth, both of Berlin.

648,019. **Shoe Sole Cutter.** United Shoe Machinery Corp., Paterson, N. J., U. S. A. Represented by A. Bohr and H. Fincke, both of Berlin.

648,020. **Tire Cutter.** Firma Otto Rissmann, Berlin.

648,611. **Vulcanizer.** North British Rubber Co., Ltd., Edinburgh, Scotland. Represented by F. During and H. Boeters, both of Berlin.

648,612. **Tire Vulcanizer.** L. Herbert, Frankfurt a. M.

PROCESS

United States

2,085,705. **Abrasive Wheel.** B. Sanford and D. E. Webster, assignors to Norton Co., both of Worcester, Mass.

2,085,859. **Manufacture of Rubber Articles.** W. Kay, Bury, England, assignor to Kaysam Corp. of America, Dover, Del.

2,086,186. **Treating Rubber.** W. E. Messer, Cheshire, Conn., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

2,086,298. **Dyeing Elastic Fabrics** A. Isaac, Lyon, assignor to Dognin, Societe Anonyme, Villeurbanne, both in France.

2,086,513. **Expanded Rubber.** D. Roberts, New York, N. Y., T. A. Scott, Baltimore, Md., and F. W. Peel, Yonkers, N. Y., assignors to Rubatex Products, Inc., a corporation of Del.

2,086,654. **Making Therapeutical Appliance.** G. L. Winder, Cuyahoga Falls, assignor to American Anode, Inc., Akron, both in O.

2,087,391. **Producing Carbon Black.** H. A. Toulmin, Jr., Dayton, O., assignor, by mesne assignments, to Commonwealth Engineering Corp., Wilmington, Del.

2,088,158. **Lining Shoe Uppers.** H. M. Spelman, Jr., Cambridge, assignors to Dewey & Almy Chemical Co., North Cambridge, both in Mass.

2,088,472. **Treating Roller Surfaces.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

Dominion of Canada

366,661. **Pipe Lining.** Dunlop Tire & Rubber Goods Co., Ltd., assignee of G. A. Ansell and W. Uffelman, coinventors, all of Toronto, Ont.

366,739. **Spindle Elastic Transmission Ring.** J. M. Marti, Sabadell, Spain.

367,231. **Dyed Rubber Product** S. B. Sklar, inventor, and M. Weiss, assignee of one-half of the interest, both of New York, N. Y., U. S. A.

367,343. **Rubber Manufacture.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of R. H. Gerke and L. H. Howland, both of Nutley, G. H. Ganzhorn, West Engelwood, both in N. J., and H. M. Smallwood, New York, N. Y., co-inventors, all in the U. S. A.

367,394. **Plant Processing.** G. E. Heyl, London, England.

367,467. **Rubber Treated Fabric.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of E. A. Murphy, Birmingham, England.

367,601. **Elastic Yarn.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of P. Adamson, Rye, N. Y., and B. H. Foster, Maplewood, N. J., co-inventors, both in the U. S. A.

United Kingdom

461,161. Bathing Garments. International Latex Processes, Ltd.

461,478. **Attaching Rubber to Rigid Surfaces.** L. Thiry.

461,497. **Carbon Black.** Coutts & Co., and F. Johnson. [Representatives of J. Y. Johnson.] (I. G. Farbenindustrie Akt.-Ges.)

461,508. **Paints.** L. C. Neale.

461,582. **Compound Fabrics.** A. G. Sladdin.

462,448. **Attaching Rubber to Metal.** R. Bosch Akt.-Ges.

462,562. **Constructing Dart Boards.** W. Wright.

462,563. **Embossing.** L. L. Salfisberg.

462,697. **Making Emulsions.** W. J. Tennant. (R. C. Benner and R. L. Melton.)

462,835. **Resist Printing Processes.** G. May.

Germany

647,636. **Rubber and Fiber Product.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

647,846. **Cutting Rubber Laces.** Elastics-Handelsgesellschaft m.b.H., Berlin.

648,560. **Producing Hollow Figures.** Continental Gummi-Werke A. G., Hannover.

CHEMICAL

United States

2,085,401. **Accelerator.** D. F. Twiss, W. Green, S. Coldfield, and F. A. Jones, all of Birmingham, England, assignors to Dunlop Tire & Rlbber Corp., Buffalo, N. Y.

2,085,778. **Alkyd Resin Compositions.** H. A. Winkelmann, Chicago, Ill., assignors to Marbon Corp., a corporation of Del.

2,087,199. **Age Resister.** A. M. Clifford, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.

2,087,200. **Accelerators.** A. M. Clifford, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.

2,087,337. **Chlorinated Rubber Adhesive.** W. J. Tomsicek and J. B. Calva, both of St. Paul, Minn., and L. L. Dodge, Rhinelander, Wis., Tomsicek and Calva assignors, by direct and mesne assignments of their right, to Dodge Chemical & Mfg. Co., Chicago, Ill.

Dominion of Canada

367,225. **Insulation Compound Using Reclaim.** Western Electric Co., Inc.,

New York, N. Y., assignee of A. R. Kemp, Westwood, and J. H. Ingmanson, Rahway, co-inventors, both in N. J., both in the U. S. A.

367,227. **Rubber Hydrohalide Package Material.** Wingfoot Corp., Akron, O., assignee of W. C. Calvert, Oak Park, Ill., all in the U. S. A.

367,254. **Road Material.** A. E. H. Dussek, Bromley, England.

367,342. **Sealing Compound.** Dewey & Almy Chemical Co. of Canada, Ltd., Farnham, P. Q., assignee of W. A. Kalber, Somerville, Mass., U. S. A.

367,602. **Non-Blowing Wire Compound.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of E. B. Curtis, Yonkers, N. Y., U. S. A.

United Kingdom

461,101. **Laminated Insulator.** British Thomson-Houston Co., Ltd.

461,175. **Battery Case Non-Vulcanizing Compound.** E. R. Dillehay.

461,352. **Aldehyde Condensation Products.** W. W. Groves. (Deutschen Celluloid-Fabrik.)

461,354. **Viscous Compounding Ingredients.** Coutts & Co. and F. Johnson. [Representatives of J. Y. Johnson.] (I. G. Farbenindustrie Akt.-Ges.)

461,558. **Fibrous Compositions.** N. Strachovsky.

461,631. **Chlorinated Rubber Coating Composition.** Chemische Fabrik Buckau.

461,632. **Rubber-like Material.** R. Beyer Industrial Inventions, Ltd. (R. Beyer.)

461,679. **Latex Stabilizer.** A. G. Rodwell, S. G. Barker, and Flexatex, Ltd.

461,680. **Latex Flooring Composition.** A. G. Rodwell, S. G. Barker, and Flexatex, Ltd.

462,008. **Chlorinated Rubber Coating Compositions.** F. C. D. Teague and Detel Products, Ltd.

462,042. **Antioxidants.** Rubber Service Laboratories Co.

462,101. **Coated Surfaces.** International Latex Processes, Ltd.

462,168. **Footwear Compositions.** G. W. Beldam.

462,492. **Rubber Surface Roughening.** Veedip, Ltd., and S. D. Sutton.

462,613. **Oxidized Rubber Varnishes.** Rubber Producers Research Association, H. P. Stevens, and F. J. W. Popham.

462,627. **Depolymerized Rubber.** Rubber Producers Research Association, H. P. Stevens, and F. J. W. Popham.

462,691. **Sealing Compound for Cartridges.** J. Taylor and Imperial Chemical Industries, Ltd.

462,760. **Age and Fatigue Resistant Compounds.** R. T. Vanderbilt Co.

462,783. **Rubber and Fiber Composition.** T. Shiraishi.

462,786. **Rubber Lubricant.** J. Fromm.

462,840. **Deproteinized Rubber.** Rubber Producers Research Association H. P. Stevens, and J. W. W. Dyer.

462,924. **Diluents for Ink Solvents.** International Printing Ink Corp.

GENERAL

United States

20,431. (Reissue) **Tire Tread.** G. W. Anderson, assignor to General Tire & Rubber Co., both of Akron, O.

2,085,204. **Anti-skid Device.** D. J. Sullivan, Fairfield, Conn., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

2,085,234. **Elastic Waist Band.** L. J. Sherman, Orange, N. J.

2,085,249. **Respirator.** E. W. Bullard, assignor, by mesne assignments, to E. D. Bullard Co., both of San Francisco, Calif.

2,085,320. **Trolling Rubber.** A. Kolstrand, Seattle, Wash.

2,085,347. **Horseshoe.** V. P. Wachter, Joliet, Ill.

2,085,369. **Valve.** K. B. Kilborn, assignor to Seiberling Latex Products Co., both of Akron, O.

2,085,392. **Container with Biological Substances.** J. Reichel, assignor to Sharp & Dohme, Inc., both of Philadelphia, Pa.

2,085,467. **Glove.** S. Lipton, New York, N. Y.

2,085,534. **Soap.** E. N. Klemgard, Martinez, assignor to Shell Development Co., San Francisco, both in Calif.

2,085,602 **Floor Covering Coating.** R. H. Pohl, Upper Darby, assignor to Sloane-Blabon Corp., Philadelphia, both in Pa.

2,085,901. **Folding Bath Stand.** C. T. De Puy and W. C. Baxter, assignors to Trimble Nurseryland Furniture, Inc., all of Rochester, N. Y.

2,085,913. **Garment.** S. Lipton, New York, N. Y.

2,086,094. **Ball.** M. B. Reach, Springfield, Mass., assignor to A. G. Spalding & Bros., New York, N. Y.

2,086,109. **Commode Pad.** L. Albert, New York, N. Y.

2,086,200. **Fluid Pressure Device.** J. Wright, Coventry, assignor to Dunlop Rubber Co., Ltd., London, both in England.

2,086,389. **Arch Support.** S. C. Pearson, New York, N. Y.

2,086,657. **Eraser Attachment.** D. M. Alford, Nashville, Tenn.

2,086,925. **Syringe.** O. O. R. Schwidetzky, Hasbrouck Heights, and A. Webster, Passaic, assignors to Becton, Dickinson & Co., Rutherford, all in N. J.

2,087,228. **Tire Flap.** T. Ashworth, Cuyahoga Falls, O.

2,087,246. **Rubberized Garment.** J. M. Edwards, Cascade, Iowa.

2,087,248. **Composition Sheet.** A. C. Fischer, Chicago, Ill.

2,087,310. **Pencil Eraser.** H. B. Van Dorn, Maplewood, assignor to Joseph Dixon Crucible Co., Jersey City, both in N. J.

2,087,489. **Fuel Plate for Vulcanizing.** P. Van Cleef, assignor to Van Cleef Bros., both of Chicago, Ill., consisting of N., F., M., and P. Van Cleef.

2,087,511. **Syringe.** J. Gould, Chicago, Ill.

2,087,569. **Gasket Material.** R. J. Dunn, Fairfield, Conn., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

2,087,620. **Garter.** S. Lipton, New York, N. Y.

2,087,676. **Device for Sealing Preserving Glasses.** F. Schimmel, Berlin, Germany.

2,087,780. **Douche Package.** S. Powell, New York, N. Y.

2,087,805. **Douche.** S. T. Matsinger, Philadelphia, Pa.

2,087,820. **Fabric Knitting Machine.** H. N. Sheppard, Maplewood, N. J., assignor to Scott & Williams, Inc., New York, N. Y.

2,088,302. **Combination Trunks and Supporter.** T. D. McKeever, Los Angeles, Calif.

2,088,358. **Bolt Anchor.** L. R. Adams, Akron, O.

2,088,378. **Pin Roll.** J. J. Krehbiel, Bronx, N. Y.

2,088,403. **Trouser Protector.** I. M. Brown, Vancouver, Wash.

2,088,423. **Corset.** J. J. Kispert, Hamden, assignor to I. Newman & Sons, Inc., New Haven, both in Conn.

2,088,470. and 2,088,471. **Printing Roller.** A. L. Freedlander, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,088,561. **Tire Cover.** T. J. Bagley, Haddonfield, N. J., and V. M. Mantz, Philadelphia, Pa., assignors to R. M. Hollingshead Corp., Camden, N. J.

Dominion of Canada

366,737. **Horse Collar.** H. C. Kirby, Sunbury, O., U. S. A.

367,245. **Tire Tube.** G. S. Andrews, Nashville, Tenn., U. S. A.

367,284. **Mop Bumper.** A. D. Sund, Santa Rosa, Calif., U. S. A.

367,290. **Heel Top Lift.** W. Wood, Jr., Vancouver, B. C.

367,328. **Floor Covering Backing.** Baldwin Rubber Co., assignee of S. C. Clark, H. M. Pryale, and D. R. Cotterman, co-inventors, all of Pontiac, Mich., U. S. A.

367,431. **Rubber Covered Impeller.** Canadian General Electric Co., Ltd., assignee of G. A. H. Grierson, both of Toronto, Ont.

367,533. **Permanent Wave Heater.** L. E. Knospe, Chicago, Ill., U. S. A.

United Kingdom

461,014. **Luggage Receptacle.** F. W. Taylor.

461,021. **Corsets.** R. & W. H. Symington & Co., Ltd., and J. E. Broome.

461,039. **Corsets.** R. Scales.

461,046. **Girdle Trunks.** A. Boudo.

461,074. **Boot and Shoe Protector.** J. Whitehead.

461,143. **Bathing Caps.** J. S. Chapple, and B. V. Chotzner.

461,144. **Shock Absorbers.** Ribbesford Co., Ltd., and J. H. Onions.

461,283. **Vehicle Bumpers.** Corner-croft, Ltd., and N. Rycroft.

461,294. **Head and Body Coverings.** H. Ryner.

461,295. **Inflatable Body Attachments.** R. Fyfe.

461,314. **Building Blocks.** H. Warburton and W. A. Wright.

461,332. **Bust Supports.** V. F. Kemp and Developments & Improvements, Ltd.

461,348. **Intra-uterine Device.** L. W. Meckstroth.

461,395. **Tires.** H. Grummer.

461,416. **Suspenders.** P. Pugniet.

461,514. **Foot Guards.** Willey & Co., Ltd., United Gas Industries, Ltd., and C. H. Hitchen.

461,560. **Vehicle Bodies.** Getefo Ges. Fur Technischen Fortschritt.

461,577. **Shock Absorbers.** Ribbesford Co., Ltd., J. H. Onions, and P. W. Thornhill.

461,605. **Washing Machine Plungers.** S. Koffler.

461,606. **Valves.** Michelin & Cie.

461,613. **Compound Sheet Materials.** Wingfoot Corp.

461,618. **Lace Machine Jacquards.** H. Goodley.

461,689. **Air Cushions.** B. Binner and I. Hersinhod.

461,743. **Compound Sheet Materials.** Dunlop Rubber Co., Ltd., S. A. Brazier, and J. Partington.
461,842. **Bandages.** E. C. McNally.
461,857. **Valves.** E. Lod and W. K. Webster.
461,860. **Centrifugal Pumps.** C. G. McLachlan.
461,899. **Electric Cables.** J. Rohling and E. Kimenkowski.
461,912. **Couplings.** General Electric Co., Ltd., and F. G. Quance.
461,931. **Elastic Yarns.** T. A. Clayton. (U. S. Rubber Products, Inc.)
461,938. **Elastic Yarns.** N. E. Randall.
461,942. **Automatic Window Opener.** C. H. Nichols.
462,034. **Milk Coolers.** Pulsometer Engineering Co., Ltd., and J. B. Clews.
462,051. **Specific Gravity Estimating Apparatus.** J. H. Collie.
462,069. **Joints.** L. Ricefield.
462,077. **Brush Container.** F. J. R. Law.
462,091. **Projection Screens.** R. Lambert.
462,129. **Coated Fabrics.** A. G. Rodwell, S. G. Barker, and Flexatex, Ltd.
462,154. **Printing Surfaces.** H. Pelletier.
462,155. **Hand Grips for Baseball Bats.** H. L. Fletcher.
462,179. **Cushion Device.** F. H. Corber, and C. B. Wardman.
462,265. **Raincoats.** Hirst & Thackway, Ltd., and E. W. Wood.
462,277. **Bottle Stoppers.** F. Casablancas.
462,300. **Card Boxes.** W. H. Storey.
462,378. **Reflectors.** F. Hunter.
462,426. **Body Supporting Garment.** D. Blair.
462,432. **Hose Suspender Grips.** L. Blumenthal (trading as Blumenthal Lipot Ex Tarsa) and S. Markus.
462,467. **Cloth Wringers.** W. H. Kober.
462,477. **Hand Stamps.** P. J. McChesney.
462,496. **Cables.** Soc. Anon. Ing. V. Tedeschi & Co.
462,509. **Gun Mountings.** Materiels & Armements Modernes.
462,542. **Resilient Mountings.** A. H. G. Girling.
462,570. **Preventing Ice on Aircraft.** Dunlop Rubber Co., Ltd., and J. Wright.
462,586. **Pneumatic Sucker Fastenings for Flag Posts.** O. and J. C. Folds (trading as G. Armstrong & Co.).
462,590. **Compound Sheet Materials.** B. Lentschewsky.
462,615. **Valves.** Dunlop Rubber Co., Ltd., and P. J. Bawcutt.
462,633. **Buoyant Body Attachments.** W. H. Downing.
462,638. **Shuttlecocks.** H. Cooley.
462,648. **Irrigators.** A. Brosch.
462,656. **Valves.** Pittsburgh Equitable Meter Co.
462,672. **Wire Drawing Machine.** S. H. Richards, W. H. A. Robertson & Co., Ltd., British Insulated Cables, Ltd., and W. J. Clements.
462,740. **Arch Supports.** K. Schutte.
462,756. **Valves.** Scovill Mfg. Co.
462,796. **Toys.** W. Lines. (G. Kellner.)
462,799. **Valves.** Scovill Mfg. Co.
462,895. **Arc Welding Machine.** Babcock & Wilcox, Ltd.
462,905. **File Holder.** Moore's Modern Methods, Ltd., and B. Moore.
462,907. **Scouring Pad.** Metal Textile Corp.

Germany

648,167. **Rubber Soled Shoe.** Hungarian Rubber Goods Factory, Budapest, Hungary. Represented by J. Reitstotter, Berlin.
648,230. **Card with Clothing with Undersurface of Rubberized Fabric and Rubber Cover.** Continental Gummi-Werke, A. G., Hannover.
648,690. **Haemorrhoidal Pessary.** A. Auerbach, Berlin.

TRADE MARKS

United States

347,559. Label containing the words: **"Atlas Lug Grip Tire. Sure Traction in Mud and Snow. Made in U. S. A. 6-Ply 5.50/5.25-17. Use No Flap with Drop Center Rim."** Tires. Atlas Supply Co., Newark, N. J.
347,660. Representation of two eagles, one carrying a flag. Storage batteries. Goodyear Tire & Rubber Co., Inc., Akron, O.
347,661. Representation of a flag. Storage batteries. Goodyear Tire & Rubber Co., Inc., Akron, O.
347,662. **Strongpath.** Storage batteries. Goodyear Tire & Rubber Co., Inc., Akron, O.
347,731. Label containing the word: **"Mareng - Cell."** Synthetic rubber fabric tank. Glenn L. Martin Co., Baltimore, Md.
347,791. **Shush.** Toilet seat rings. Sponge Rubber Products Co., Derby, Conn.
347,841. Circle with an oval containing the word: **"Du Pont"** and an anchor underneath. Rubber coated fabrics, rubber sheeting, fabrics coated with sponge rubber, etc. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
347,849. **Blue Streak.** Soft baseballs. Weiss-Patinkin Co., Chicago, Ill.
347,853. **Skyward.** Golf balls. United Cigar-Whelan Stores Corp., New York, N. Y.
347,871. **Blair's Correct-U.** Abdominal belts. Blair Corset Co., Inc., Chicago, Ill.
347,887. **Kelsanite.** Compounded aqueous dispersions of rubber for protective coatings. Kelsan Products, St. Clair, Mich.
347,949. An oval containing representation of a man and the words: **"Red-Hot."** Chewing Gum. Pulver Co., Inc., Rochester, N. Y.
348,034. Representation of a cup with the words: **"Gold Cup."** Golf clubs. Dunlop Tire & Rubber Corp., Buffalo, N. Y.
348,035. Representation of a cup with The words: **"Silver Cup."** Golf clubs. Dunlop Tire & Rubber Corp., Buffalo, N. Y.
348,050. Representation of a robot with the word **"Permobond"** written through it. Rubber lined tanks. United States Rubber Products, Inc., New York, N. Y.
348,063. **Flox E Lox.** Elastic webbing. United Elastic Corp., Easthampton, Mass.
348,081. Representation of a chicken emerging from a half shell. Golf balls. A. G. Spalding & Bros., New York, N. Y.
348,082. **Ugly Duckling.** Golf balls. A. G. Spalding & Bros., New York.
348,118. **Midwate.** Elastic hosiery, Horn Surgical Co., Philadelphia, Pa.
348,127. **Lorraine Wave Set.** Combs. Glemby Co., Inc., New York, N. Y.
348,173. **Dixie. Heels.** Jenco Bros., Inc., Paterson, N. J.
348,246. **Rubaflex.** Footwear. Hood Rubber Co., Inc., Watertown, Mass.
348,403. **A. & F. Co.** Rubber blankets, etc. Abercrombie & Fitch Co., New York, N. Y.
348,450. **Gem Royale.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.
348,458. Diamond with representation of an eagle containing the words: **"New York Rubber Corporation, New York"** and the words: **"Blue Bird"** underneath the eagle. Belting and hose. New York Rubber Corp., Beacon, N. Y.
348,518. **Tear-Drop.** Garters. Condor Products, Inc., Buffalo, N. Y.
348,553. **Blair's Health-Ade.** Abdominal belts. Blair Corset Co., Inc., Chicago, Ill.

OHIO

(*Continued from page 72*)

ford-Smith, missing on a flight from London to Australia in November, 1935, he revealed that the tire, made by Goodrich, floating for nearly two years, was still fully inflated.

New Heater for Buses

A new specially designed hot air heater for buses is now being marketed by Goodrich. The new bus heater is designed to deliver a high volume of heat into the passenger compartment of the bus and at the same time produce sufficient heat for two windshield defrosters, providing maximum comfort and safety during cold weather. Two heavy-duty, high-speed motors deliver 840 cubic feet of air a minute through the front grill and 40 cubic feet a minute out of each of two defroster openings.

With 3,873 square feet of radiation surface, the heater has overall length of 16 inches, is nine inches high. Finished in brown crackle, with a chromium plated permanent deflector and other chromium trimmings, the new heater can be mounted either on the dash or under the seat. A protective grill on the back prevents damage to motors or fans, or injuries when the heater is mounted under the seat. Fittings are a Casco heavy-duty illuminated heat control switch, 10-foot length of one-inch braided hose, two special hose adapters, and four special hose clamps.

Firestone Tire & Rubber Co., Akron, at a recent meeting of its directorate elected George H. Seybold vice president and general manager of Firestone Plantations Co. He has already reached Liberia, where he has taken up his duties. On July 16 about 50,000 Firestone employes and their friends held their annual outing at Euclid Beach Park, where dancing, swimming, boating, and bathing beauty contests were outstanding attractions. August 28 was Firestone Day at the Great Lakes Exposition, Cleveland.

NEW PUBLICATIONS

"News about du Pont Rubber Chemicals." E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Included with this news letter, dated August 6, 1937, were five reports:

(1) "Neoprene Compounding Principles." This 24-page report is the beginning of a series of publications on neoprene compounding technique. This series will include data on the newer Neoprene Type E. Part I deals with the effect of primary vulcanizing ingredients such as magnesium oxide, zinc oxide, and litharge on neoprene. Examples of compounds and a summary of physical test data are given. Part 2 reports the effects of sulphur on the vulcanization of neoprene compounds. Physical test data on typical compounds illustrate these effects. Part 3 deals with the effect of various pigments on vulcanization and physical properties of neoprene. Pigments tested include carbon black, clay, whiting, and zinc oxide. All data is in convenient tabular form.

(2) "Neoprene Curing Method." For securing greater production from molds and presses, this four-page report suggests using the press only for forming in the mold, completing the cure afterwards by heating in steam or air. Results of physical tests show the effect of this method on type compounds. (3) "Neoprene-Carbon Black Masterbatches." A few recommendations are offered in this one-page report for mixing and handling masterbatches of neoprene and various blacks. (4) "Footwear Compounding." Section 1 of 18 pages discusses rubber compounding for footwear. Numerous compounds are given for various footwear applications with summaries of physical tests. Section 2 devotes three pages to neoprene footwear compounding and points out that neoprene compounds will make footwear both waterproof and resistant to the action of oils, solvents, and chemicals. (5) "The Use of Peptizing Agents in Sponge Rubber." This 2-page report recommends the use of RPA No. 1 and RPA No. 2 for reducing mastication time in the preparation of rubber for sponge. It discusses methods of milling, percentages of peptizing agent manufacture and the degree of plasticity obtained.

"Accident Facts." 1937 Edition, National Safety Council, Inc., Chicago, Ill., 96 pages. This booklet presents a vivid description by illustrations and diagrams of the nation's accident experience during 1936. Detailed statistics in the form of tables and charts provide a ready reference for accident facts. Approximately 20 pages are devoted to occupational accidents. Industries are listed in separate tables according to frequency, severity, and type of accidents. On page 69, the best no-injury records in American industry are given.

"Bulletin No. 490." The Bristol Co., Waterbury, Conn. This bulletin gives details regarding various types of applications of Bristol Metameters for telemetering and remote control and explains how these instruments measure, transmit, and record readings over a simple two-wire circuit. These instruments include Metameters for remote recording or indicating of transmitted pressure, liquid level, flow, temperature, mechanical motion, and electrical units as well as controllers for pressure, liquid level, flow, and temperature.

"Green Book Buyers Directory," 1937-38 Edition. Oil, Paint and Drug Reporter, Inc., 12 Gold St., New York, N. Y. 1,004 pages. The twenty-fifth annual edition of this directory brings up to date an informative service for industrial buyers and sellers in the chemical, oil, drug, and related industries. It should be pointed out that manufacturers of rubber compounding ingredients and supplies are listed. The directory which gives the name of the material, supply, etc., followed by the name and address of the manufacturer, is divided into four sections. The first is concerned with industrial materials such as chemicals, dyes, drugs, oils, and rubber compounding materials. Apparatus, containers, machinery, and equipment are treated in the second part. Part 3 lists engineers, chemists, and technical and commercial services. A new section, Part 4, contains a list of trade names and brand names.

"To Improve Corrective Water Treatment." Leeds & Northrup Co., Philadelphia, Pa., 20 pages. This illustrated pamphlet describes methods and instruments used for manual or automatic pH control in corrective water treatment for municipal or industrial plants. Among the recommended uses for this process are neutralization, coagulation, lime softening, corrosion prevention, and boiler water treatment. Directions for operation, maintenance, and installation of equipment are presented. Equipment specification and dimension charts complete this informative booklet.

"Anaconda Duraseal Cable." Anaconda Wire & Cable Co., 25 Broadway, New York, N. Y. 20 pages. This booklet concerns itself with the non-metallic sheathed cable known as Duraseal. The construction, advantages, applications, and performance of this cable are discussed thoroughly with amplifying illustrations given. Detailed instructions for making joints for both low and high voltage cables of this type are included. Six pages are devoted to tables concerning the construction and properties of Duraseal cables.

"Functions of the Traffic Manager." Policyholders Service Bureau, Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y. This report is based on data obtained from the traffic executives of 24 representative companies and states that a traffic manager is charged with the responsibility of obtaining efficient, economical, and adequate transportation services. The review recognizes that there are wide differences in the duties of traffic managers in industrial companies and these duties may include supervision of the shipping and receiving departments, and cooperation with sales, purchasing, and production executives.

Specific points for consideration as affecting the installation of a traffic department are also given. In the appendix there is a detailed listing of the activities of the 24 reporting traffic managers.

"Salt Tablet Dispenser." Mine Safety Appliances Co., Pittsburgh, Pa. A new two-page bulletin, No. FA-57, describes the M.S.A. salt tablet dispenser, a device designed for the dispensing of salt in tablet form as a preventative for heat sickness. Established by medical research as an efficient method of renewing the supply of salt lost from the system in excessive perspiration, salt tablets, are now being widely used in companies where hot working conditions exist. Copies of this bulletin are available from the manufacturer.

"Hard-Facing with Haynes Stellite Products." Fourth Edition, Haynes Stellite Co., Kokomo, Ind. 104 pages. This illustrated booklet describes methods of applying hard-facing materials to wearing surfaces to give them longer life. On page 78, for example, are applications to valves for high temperature, high pressure steam service. The final section describes four different anti-corrosive Hastelloy alloys.

"The Cash Budget." Policyholders Service Bureau, Metropolitan Life Insurance Co., New York, N. Y. 40 pages. This report is the result of an investigation of the cash budget methods used by 45 companies engaged in 20 different industries. The three general methods of forecasting cash requirements have been designated as: (1) the receipts and disbursements method; (2) the adjusted income method; and (3) the working capital differentials method. It is disclosed that forecasting procedures for small and large companies differ only in the degree of elaboration necessary. Examples of procedure are given with budget forms and records in current use. Responsibility for forecasts and use of the daily cash report are discussed. The appendix presents an excerpt from the cash budget manual of one company.

Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

Futures	June 26	July 31	Aug. 7	Aug. 14	Aug. 21
July	19.58	....	....	....	....
Aug.	....	18.40	18.72	18.26	18.18
Sept.	19.76	18.42	18.74	18.28	18.20
Dec.	19.93	18.58	18.88	18.45	18.40
Mar.	20.12	18.68	18.96	18.59	18.60
June	....	18.74	19.09	18.73	18.72
July	....	....	19.13	18.77	18.76
Volume (tons) per week .	15,890	10,210	8,380	8,970	11,430

THE Commodity Exchange table published here shows the prices of representative future contracts on the New York market during the past two months.

Since July 24, when the price of No. 1 ribbed smoked sheets for December delivery was 18.61¢, the level has remained steady, closing at 18.40¢ on August 21, this being the lowest week-end closing price during the month. During the past four weeks the maximum variation in prices for delivery during the next year was .58¢ per pound. Trading in August was only moderate, showing less than 9,000 tons during each of the weeks ending August 7 and 14, with an increase to 11,430 tons in the week ending August 21.

Figures released by The Rubber Manufacturers Association estimate July consumption of crude in the United States at 43,650 long tons as compared with 51,798 long tons during June and 48,250 (revised) long tons in July, 1936. July's consumption was the smallest for any month since March, 1936. However the total for the first seven months of 1937 is at the record level of 355,747 long tons in comparison with the previous high of 331,950 long tons for the corresponding period in 1936.

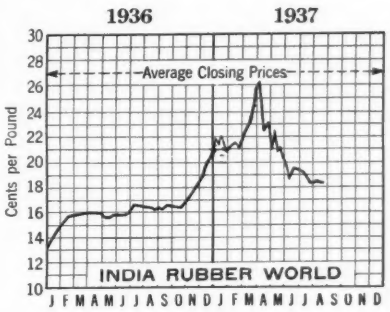
With the exception of Spain all countries have absorbed more rubber in 1937 than in the same period of 1936. The rates of increase are: World, 15.1%; United States, 7.2%; and countries outside of the United States, 25.6%. Germany, despite its 100% import tax, has increased its net imports for 1937 by 42.5% monthly over the same period in 1936. Net imports into Japan have risen sharply by 2,668 long tons monthly average, or 57½% over 1936.

New York Quotations

New York outside market rubber quotations in cents per pound

	Aug. 27, 1936	July 27, 1937	Aug. 27, 1937
Plantations			
Rubber latex..*gal.*	61/62	67/68	67/68
Paras			
Upriver fine	20½	19¾	19½
Upriver fine	*25	*25½	*24
Upriver coarse ...	11¾	12	12
Upriver coarse ...	*17	*18½	*21
Islands fine	21	19	19¼
Islands fine	*25½	*25	*24
Acre, Bolivian fine	21	20	19½
Acre, Bolivian fine	*25½	*26	*25
Beni, Bolivian fine	21	20½	20¼
Madeira fine	20½	19¾	19¾
Caucho			
Upper ball	11¾	11	11
Upper ball	*17	*16	*21
Lower ball	11½	10½	10½
Pontianak			
Bandjermasin	6	8	7½
Pressed block	9/20	11/31	11/32
Sarawak	6	8	7½
Guayule			
Duro, washed and dried	13¼	15	14½
Ampar	13¾	15½	15
Africans			
Rio Nuñez	14¾	20½	20
Black Kassai	15	19¾	19
Prime Niger flake.	27	26½	28
Gutta Percha			
Gutta Siak	10¼	10¼	10½
Gutta Soh	15	19	19½
Red Macassar 1.00		1.10/1.20	1.10/1.40
Balata			
Block, Ciudad Bolivar	30	31	30
Manaos block	27	28	28½
Surinam sheets ..	33	38	36
Amber	37	41	40

*Washed and dried crepe. Shipments from Brazil.



New York Outside Market—Spot Ribbed Smoked Sheets

Gross imports of crude rubber into the United States are estimated at 39,108 long tons for July, 20.1% less than the June figure of 48,956, but 9% over the 35,881 long tons for July, 1936.

The R. M. A. estimates of total domestic stocks on hand July 31 are placed at 164,445 long tons against 169,646 on June 30 and 235,850 (revised) long tons as of July 31, 1936.

Crude rubber afloat to United States ports on July 31 were estimated at 75,779 long tons in comparison with 57,215 on June 30 and 60,343 on July 31, 1936.

New York Outside Market

Factory purchases remained steady at only a moderate rate during August, with occasional signs of greater temporary activity.

No. 1 ribbed smoked sheets showed very little price fluctuation between July 26 and August 20 with a maximum of 18 11/16¢ and a minimum of 18 5/16¢ per pound, closing August 26 at 18 3/16¢.

The week-end closing prices on No. 1 ribbed smoked sheets follow: July 24, 18 3/8¢; July 31, 18 3/8¢; August 7, 18 11/16¢; August 14, 18 5/16¢; and August 21, 18¼¢ per pound.

New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

	July, 1937						August, 1937														
	26	27	28	29	30	31*	2	3	4	5	6	7*	9	10	11	12	13	14*	16	17	18	19	20	21*
No. 1 Ribbed Smoked Sheet	18 5/16	18 7/16	18 5/16	18 5/16	18 3/8	..	18 7/16	18 3/16	18 1/2	18 11/16	18 11/16	..	18 11/16	18 7/16	18 7/16	18 5/16	18 5/16	..	18 5/16	18 1/4	18 1/4	18 1/4	18 1/4	..
No. 2 Ribbed Smoked Sheet	18 1/16	18 1/4	18	18 1/16	18 1/16	..	18 1/4	18	18 1/16	18 1/2	18 1/2	..	18 1/2	18 1/4	18 1/4	18 1/16	18 1/16	..	18	18 1/16	18 1/16	18 1/16	18 1/16	..
No. 3 Ribbed Smoked Sheet	17 13/16	18 1/16	17 13/16	17 13/16	18	..	18 1/16	17 13/16	18	18 1/16	18 1/16	..	18 5/16	18 1/16	18 1/16	17 13/16	17 13/16	..	17 13/16	17 7/8	17 7/8	17 7/8	17 7/8	..
No. 4 Ribbed Smoked Sheet	17 3/4	17 7/8	17 5/8	17 3/4	17 13/16	..	17 7/8	17 5/8	17 13/16	18 1/16	18 1/16	..	18 1/8	17 7/8	17 7/8	17 3/4	17 3/4	..	17 5/8	17 11/16	17 11/16	17 11/16	17 11/16	..
No. 1 Thin Latex Crepe...	20 1/16	20 1/16	20	20	20 1/16	..	20	19 3/4	19 1/2	19 11/16	19 11/16	..	20	19 3/4	19 3/4	19 5/16	19 3/16	..	19 1/2	19 1/2	19 1/2	19 1/2	19 1/4	..
No. 1 Thick Latex Crepe..	20 1/16	20 3/16	20 1/4	20 1/4	20 3/8	..	20 1/4	20	19 3/4	19 11/16	19 11/16	..	20 1/4	20	20	19 7/8	19 7/8	..	19 3/4	19 3/4	19 3/4	19 3/4	19 1/2	..
No. 1 Brown Crepe.....	16 11/16	17 1/16	17	17	17	..	17	16 7/8	17 1/16	17 3/16	17 3/16	..	17 3/16	17 1/16	17 1/16	17	17	..	16 7/8	17	17	17	17 1/16	..
No. 2 Brown Crepe.....	16 11/16	17 1/16	16 7/8	16 7/8	16 7/8	..	16 7/8	16 3/4	17	17 1/4	17 1/4	..	17 1/4	17	17	16 7/8	16 7/8	..	16 3/4	16 7/8	16 7/8	16 7/8	17	..
No. 2 Amber.....	16 11/16	17 1/16	17	17	17	..	17	16 7/8	17 1/16	17 3/16	17 3/16	..	17 3/16	17 1/16	17 7/8	17	17	..	16 7/8	17	17	17	17 1/16	..
No. 3 Amber.....	16 11/16	17 1/16	16 7/8	16 7/8	16 7/8	..	16 7/8	16 3/4	17	17 1/4	17 1/4	..	17 1/4	17	17	16 7/8	16 7/8	..	16 3/4	16 7/8	16 7/8	16 7/8	17	..
No. 4 Amber.....	16 1/16	16 1/16	16 3/16	16 3/16	16 1/4	..	16 1/4	16	16 1/4	16 1/2	16 1/2	..	16 1/2	16 1/4	16 1/4	16 1/16	16 1/16	..	16	16 1/16	16 1/16	16 1/16	16 1/4	..
Rolled Brown	14 1/16	14 3/16	14 1/16	14 1/4	14 3/16	..	14 3/16	14 1/4	14 1/2	14 3/4	14 3/4	..	14 3/4	14 1/2	14 1/2	14 3/16	14 3/16	..	14 1/4	14 1/4	14 1/4	14 1/4	14 1/4	..

*Closed.

IMPORTS, CONSUMPTION, AND STOCKS

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Imports* Tons	U. S. Consumption¶ Tons	U. S. Stocks Mfgrs. Importers, Dealers, Etc.† Tons	U. S. Stocks Afloat† Tons	U. K.— Public Warehouses, London, Liverpool‡‡ Tons	Singapore and Penang Dealers and Port Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks‡‡§ Tons
1934	**469,484**	**453,223**	**355,000**	**47,644**	134,927	62,142	1,019,100	921,141	**735,391**
1935	**448,116**	**491,544**	**303,000**	**39,094**	164,295	28,304	872,600	937,489	**643,170**
1936	490,858	575,000	223,000	56,567	78,462	26,969	855,638	1,044,776	459,565
1936									
January ...	**31,292**	**48,631**	**296,683**	**43,870**	162,107	31,195	62,700	**85,298	581,455
February ..	35,219	36,841	293,631	46,532	157,028	38,421	63,993	71,160	583,052
March	37,451	42,813	284,561	58,935	147,712	29,322	69,228	80,341	**598,213**
April	40,370	52,031	277,478	47,678	140,404	32,200	60,005	85,155	540,478
May	35,598	50,612	262,415	48,860	130,590	26,687	68,809	90,734	515,680
June	41,835	52,772	245,544	47,228	122,285	28,260	66,459	88,660	522,650
July	35,881	48,250	235,850	60,343	113,386	29,493	83,831	86,683	491,426
August ...	42,562	46,777	230,167	63,597	108,215	28,289	71,181	81,797	469,349
September .	48,386	46,449	233,336	62,240	103,962	26,936	72,295	82,639	495,461
October ...	40,920	49,637	224,000	**67,825**	96,625	24,593	81,726	91,373	455,007
November..	44,296	50,433	211,480	**73,691**	88,781	26,761	78,327	88,117	435,622
December..	57,049	49,753	223,000	56,567	78,462	26,969	77,084	92,616	459,565
1937									
January ...	32,820	50,818	204,201	55,096	71,062	36,365	71,544	92,928	414,690
February ..	43,289	51,887	195,080	53,538	63,760	42,132	70,535	93,042	390,585
March	52,039	54,064	191,928	56,994	52,077	42,485	102,441	104,698	437,271
April	35,850	51,797	174,934	72,530	48,748	38,812	89,684	93,573	391,015
May	50,840	51,733	172,985	58,542	46,628	34,234	86,775	99,313	375,051
June	48,956	51,798	169,646	57,215	**43,427**	45,085	95,971	95,503	403,121
July	39,108	43,650	164,445	75,779	.....	.....	.....	.....	.....

* Including liquid latex. †Stocks on hand the last of the month or year. ‡Statistical Bulletin of the International Rubber Regulation Committee. §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, and afloat. ¶Corrected to 100% from estimate of reported coverage. **Not including additional absorption from U.K. manufacturers' stocks for any month during 1936. The figure will be included in yearly total.

CRUDE rubber consumption by United States manufacturers during July is estimated at 43,650 long tons, against 51,798 long tons during June, a 15.7% decrease under June and 9.5% under July, 1936, according to R.M.A. statistics. Consumption for July, 1936, was 48,250 (revised) long tons.

Gross imports of crude rubber for July are reported to be 39,108 long tons, 20.1% under the June figure of 48,956 long tons, but 9% over the 35,881 long tons imported in July, 1936.

Total domestic stocks of crude rubber on hand July 31 are figured at 164,445 long tons, compared with June 30 stocks of 169,646 long tons and 235,850 (revised) long tons on hand July 31, 1936.

Crude rubber afloat to United States ports as of July 31 is set at 75,779 long tons, against 57,215 long tons afloat on June 30 and 60,343 long tons afloat on July 31, 1936.

London and Liverpool Stocks

Week Ended	London (Tons)	Liverpool (Tons)
July 31	22,574	19,482
August 7.....	22,601	19,652
August 14.....	23,411	19,438
August 21.....	24,055	19,968

RECLAIMED RUBBER

THE July consumption of reclaim totaling 11,924 tons, according to The Rubber Manufacturers Association report, declined sharply along with crude rubber usage, from the June figure of 14,414 tons, and 12,856 tons during July, 1936. For the first seven months of 1937 the consumption of reclaim amounted to 101,267 tons against 76,446 tons for the same period in 1936.

The prices for reclaimed rubber remain the same as last month. There appears no logical reason for drastic fluctuations in the near future. Labor costs have been more or less on the increase and raw materials have not shown any definite downward trend.

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption†	Consumption % to Crude	U. S. Stocks*	Exports
1934	110,010	100,597	22.3	23,079	4,737
1935	122,140	113,530	22.9	25,069	5,383
1936	150,571	141,486	24.6	19,000	7,085
1937					
January	15,129	14,450	28.4	18,822	857
February	15,192	14,578	28.1	18,490	946
March	14,462	15,601	28.9	16,450	901
April	13,884	15,607	30.1	14,046	1,140
May	15,793	14,693	28.4	14,647	890
June	16,052	14,414	27.8	14,535	1,077
July	16,241	11,924	27.3	17,885	...

*Stocks on hand the last of the month or year. †Corrected to 100% from estimate of reported coverage.
Compiled by The Rubber Manufacturers Association, Inc.

RUBBER SCRAP

THE demand for all grades of rubber scrap held strong during August and in general is reported to be somewhat ahead of the supply, especially in the case of tires where the bulkiness tends to make tire collecting less attractive than metal scrap. The supply of No. 1 floating tubes is at present limited.

Prices on most of the grades are unchanged from those published August 1 except that reductions were made of 50¢ to $1 per ton on beadless and mixed auto tires with beads, $5 per ton on mixed black mechanical scrap, and from $1.50 to $2 per ton on hose scrap. Since the quotations of August 1, some temporary decline has been experienced, but the market has stiffened to the point where present prices are practically at the same level as those of the previous month.

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)
August 27, 1937

		Prices
Boots and Shoes		
Boots and shoes, black	*lb.*	$0.01¼/$0.01⅜
Colored	*lb.*	.00⅞/ .01
Untrimmed arctics	*lb.*	.01 / .01⅛
Inner Tubes		
No. 1, floating	*lb.*	.14½/ .15
No. 2, compound	*lb.*	.06¼/ .06⅜
Red	*lb.*	.06¼/ .06⅜
Mixed tubes	*lb.*	.06 / .06⅛
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	*ton*	14.50 /15.50
Beadless	*ton*	21.50 /22.00
Auto tire carcass	*ton*	30.00 /33.00
Black auto peelings	*ton*	24.00 /26.00
Solid		
Clean mixed truck	*ton*	32.00 /33.00
Light gravity	*ton*	42.00 /45.00
Mechanicals		
Mixed black scrap	*ton*	20.00 /25.00
Hose, air brake	*ton*	29.00 /31.00
Garden, rubber covered	*ton*	15.00 /16.00
Steam and water, soft	*ton*	15.00 /16.00
No. 1 red	*lb.*	.04¼/ .04½
No. 2 red	*lb.*	.02¾/ .03
White druggists' sundries	*lb.*	.04½/ .05
Mechanical	*lb.*	.02½/ .03
Hard Rubber		
No. 1 hard rubber	*lb.*	.15 / .17

New York Quotations

August 27, 1937

	Sp. Grav.	¢ per lb.
Auto Tire		
Black Select	1.16-1.18	6¼/ 6½
Acid	1.18-1.22	7¼/ 7½
Shoe		
Standard	1.56-1.60	7 / 7¼
Tube		
No. 1 Floating	1.00	19 /19¼
Compounded	1.10-1.12	10½/11
Red Tube	1.15-1.30	10½/11
Miscellaneous		
Mechanical Blends	1.25-1.50	4½/ 5
White	1.35-1.50	15 /15½

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

Optimum Size gives **MICRONEX BEADS**

a distinct advantage in **FLOW** *handling*

MICRONEX

THE *Premier* CARBON BLACK FOR RUBBER USE

Beads or Compressed

•

BINNEY & SMITH CO.

41 East 42nd Street, New York

•

COLUMBIAN CARBON CO.

MICRONEX BEADS

Have Optimum Size

THE process by which Micronex Beads are made permits wide diversity in the size of finished pellets. It is possible to make them either smaller or larger than normal by changing the viscosity of the paste or by varying the speed or length of agitation.

A highly interesting division of the research in pellet black was that which covered size in relation to flow handling. Experiments covering every phase demonstrated that a bead approximately 0.025 inches in diameter was most suitable.

Such a bead exhibits mobility to a high degree and because of this property lends itself easily to mechanical handling since it is necessary only to provide suitably inclined conduits with proper means to arrest the supply when the desired quantity has been permitted to flow through the system.

Such a bead also possesses desirable structural characteristics—a smooth outer surface somewhat more dense than the average of the whole pellet, which serves to keep the bead intact until it has been ruptured by the shearing action of the rubber. The soft interior is then too closely in contact with the rubber mass to fly to any great degree.

●

BINNEY & SMITH CO.

Service and Control Department

A Binney & Smith MASTER COLLOID

MICRONEX MEANS MORE MILEAGE

COMPOUNDING INGREDIENTS

BUSINESS continued dull during August, consistent with seasonal inactivity. Demand is expected to increase in the next few weeks, but some doubt exists that consumption during the final half would be as good as in the first six months.

CARBON BLACK. Demand continued light with some improvement noted toward the end of August. Production has been increased, and it is expected that stocks will be upward for several months. Prices remain unchanged. The German Trade Control Board for Carbon Black has forbidden the use of any but domestic carbon black for many important consumption purposes.

LITHARGE. Prices for all quantities advanced ¼¢ per pound on August 4 and another ¼¢ per pound on August 5. These increases caused quite a buying flurry during the market's rise. The interest of the buyers eased off as the market held without further change.

LITHOPONE. The dullness of the summer months has been in force, with activity expected soon. Prices continue at the schedule established in June.

RUBBER CHEMICALS. Business was slightly better in August than in July. Prices remain unchanged.

RUBBER SOLVENTS. Some improvement of demand was reported although business in general continued inactive. Quotations for tank car lots of light and heavy solvents remained at the levels quoted for some time past.

STEARIC ACID. Raw material weakened, and tallow declined, but aside from this activity there was an absence of new developments in the situation. Quotations were unchanged, and trade was on a moderate scale.

TITANIUM PIGMENTS. Trade has been running a little better than expected for the summer months. Price schedules have been unchanged since July 1.

ZINC OXIDE. The market is strong, with practically no stocks on hand. Prices are expected to advance approximately ¼¢ for the fourth quarter.

New York Quotations

August 27, 1937

Prices Not Reported Will Be Supplied on Application

Abrasive

Pumicestone, powdered	lb.	$0.03 /$0.03½
Rottenstone, domestic	lb.	.03 / .03½
Silica, 15	ton	38.00

Accelerators, Inorganic

Lime, hydrated, l.c.l., New York	ton	20.00
Litharge (commercial)	lb.	.08½/ .09

Accelerators, Organic

A-1	lb.	.26
A-5-10	lb.	.34
A-10	lb.	.34
A-11	lb.	.57
A-19	lb.	.57
A-32	lb.	.72
A-77	lb.	.47
A-100	lb.	.47
A-433	lb.	.50
Accelerator 49	lb.	.42
808	lb.	
833	lb.	
Acrin	lb.	
Aldehyde ammonia	lb.	
Altax	lb.	
B-J-F	lb.	
Beutene	lb.	
Butyl Zimate	lb.	
C-P-B	lb.	
Captax	lb.	
Crylene	lb.	
Paste	lb.	
D-B-A	lb.	
Di-Esterex	lb.	
Di-Esterex-N	lb.	
DOTG	lb.	.47
D.O.T.T.U.	lb.	
DPG	lb.	.37
El-Sixty	lb.	.57
Ethylideneaniline	lb.	
Formaldehyde P.A.C.	lb.	
Formaldehydeaniline	lb.	
Formaldehyde-para-toluidine	lb.	
Guantal	lb.	.40 / .50
Hepteen	lb.	
Base	lb.	
Hexamethylenetetramine	lb.	
Lead oleate, No. 999	lb.	.14
Witco	lb.	.15
Methylenedianilide	lb.	
Monex	lb.	
Novex	lb.	
O. N. V.	lb.	
Ovac	lb.	
Pip-Pip	lb.	2.50
Pipsolene	lb.	1.75
R-2	lb.	1.65
Base	lb.	3.60
R-23	lb.	.57
R & H 50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb	
Tetrone A.	lb	
Thiocarbanilide	lb.	
Thionex	lb.	
Trimene	lb.	
Base	lb.	
Triphenyl guanidine (TPG)	lb.	
Tuads	lb.	
Ureka	lb.	$0.65
Blend B	lb.	.65
C	lb.	.60
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
Z-B-X	lb.	
Z-88-P	lb.	.51
Zenite	lb.	
A	lb.	
B	lb.	
Zimate	lb.	
ZML	lb.	

Activator

Barak	lb.	

Age Resisters

AgeRite Alba	lb.	
Exel	lb.	
Gel	lb.	
Hipar	lb.	
HP	lb.	
Powder	lb.	
Resin	lb.	
D	lb.	
Syrup	lb.	
White	lb.	
Akroflex C	lb.	
Albasan	lb.	
Antox	lb.	
B-L-E	lb.	
B-X-A	lb.	
Copper Inhibitor X-872	lb.	
Flectol B	lb.	.54
H	lb.	.54
White	lb.	1.00
M-U-F	lb.	
Neozone (standard)	lb.	
A	lb.	
C	lb.	
D	lb.	
E	lb.	
Oxynone	lb.	.68
Parazone	lb.	
Perflectol	lb.	.67
Permalux	lb.	
Santoflex A	lb	
B	lb.	.54
Solux	lb.	
Thermoflex	lb.	
A	lb.	
V-G-B	lb.	

Alkalies

Caustic Soda, flake, columbia (400 lb. drums)	100 lbs.	2.70 / 3.30
liquid, 50%	100 lbs.	1.95
solid (700 lb. drums)	100 lbs.	2.30 / 2.90

Antiscorch Materials

A-F-B	lb.	
Antiscorch T	lb.	
Cumar RH	lb.	.09
Retarder B	lb.	
W	lb.	
T-J-B	lb.	
U.T.B.	lb.	

Antisun Materials

Heliozone	lb.	
Sunproof	lb.	

Brake Lining Saturant

B. R. T. No. 3	lb.	$0.0165/$0.0175

Colors

BLACK

Lampblack (commercial)	lb.	.15

BLUE

Brilliant	lb.	
Prussian	lb.	.37½
Toners	lb.	.08 /3.50

BROWN

Mapico	lb.	.13

GREEN

Brilliant	lb.	
Chrome, light	lb.	
medium	lb.	
oxide (freight allowed)	lb.	.21
Dark	lb.	
Guignet's, Easton, Pa., bbls.	lb.	.70
Light	lb.	
Toners	lb.	.85 / 3.50

ORANGE

Lake	lb.	
Toners	lb.	.40 / 1.60

ORCHID

Toners	lb.	1.50 / 2.00

PINK

Toners	lb.	1.50 / 4.00

PURPLE

Permanent	lb.	
Toners	lb.	.60 / 2.00

RED

Antimony		
Crimson, 15/17%	lb.	.50
R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48
Golden 15/17%	lb.	.28
7-A	lb.	.35
Z-2	lb.	.22
Aristi	lb.	1.75
Cadmium, light (400 lb. bbls.)	lb.	.75
Chinese	lb.	
Crimson	lb.	
Mapico	lb.	.09¼
Medium	lb.	
Rub-Er-Red, Easton, Pa., bbls.	lb.	.09¼
Scarlet	lb.	
Toners	lb.	.08 / 2.00

WHITE

Lithopone (bags)	lb.	.04⅜/ .04½
Albalith Black Label-11	lb.	.04⅜/ .04½
Astrolith	lb.	.04⅜/ .04½
Azolith	lb.	.04⅜/ .04½
Cryptone-19	lb.	.05⅞/ .06⅛
CB-21	lb.	.05⅞/ .06⅛
ZS No. 20	lb.	.09 / .09¼
No. 86	lb.	.09 / .09¼

Sunolith	lb.	$0.043⅛/$0.045⅝
Ray-Bar	lb.	
Ray-Cal	lb.	
Rayox	lb.	
Titanolith (5-ton lots)	lb.	.05¾/ .06⅛
Titanox-A (50-lb. bags)	lb.	.16 / .17
B (50-lb. bags)	lb.	.05⅞/ .06⅛
B-30 (50-lb. bags)	lb.	.05⅞/ .06⅛
C (50-lb. bags)	lb.	.05⅞/ .06⅛
Ti-Tone	lb.	
Zinc Oxide		
Anaconda, Green Seal		
No. 333	lb.	.08 / .08½
Lead Free No. 352	lb.	.07½/ .08
No. 570	lb.	.07½/ .08
No. 577	lb.	.07½/ .08
Red Seal No. 222	lb.	.07½/ .08
U.S.P. No. 777 (bbls.)	lb.	.09½/ .09¾
White Seal No. 555	lb.	.08½/ .09
Azo ZZZ-11	lb.	.06¼/ .06½
44	lb.	.06¼/ .06½
55	lb.	.06¼/ .06½
66	lb.	.06¼/ .06½
French Process, Florence		
White Seal-7 (bbls.)	lb.	.08½/ .08¾
Green Seal-8	lb.	.08 / .08¼
Red Seal-9	lb.	.07½/ .07¾
Kadox, Black Label-15	lb.	.06½/ .06¾
Blue Label-16	lb.	.06½/ .06¾
Red Label-17	lb.	.06½/ .06¾
No. 25	lb.	.07½/ .07¾
Horse Head Special 3	lb.	.06¼/ .06½
XX Red-4	lb.	.06¼/ .06½
23	lb.	.06¼/ .06½
72	lb.	.06¼/ .06½
78	lb.	.06¼/ .06½
80	lb.	.06¼/ .06½
103	lb.	.06½/ .06¾
110	lb.	.06½/ .06¾
St. Joe (lead free)		
Black Label	lb.	.06¼/ .06½
Green Label	lb.	.06¼/ .06½
Red Label	lb.	.06¼/ .06½
U.S.P. X	lb.	.09 / .09¼
White Jack	lb.	.09 / .09¼
YELLOW		
Cadmolith (cadmium yellow), 400 lb. bbls.	lb.	.50
Lemon	lb.	
Mapico	lb.	.09½
Toners	lb.	2.50

Dispersing Agents

Bardol	lb.	.0215/ .024
Darvan	lb.	
Santomerse	lb.	.13

Fillers, Inert

Asbestine, c.l., f.o.b. mills	ton	15.00
Barytes	ton	30.00 /36.00
f.o.b. St. Louis (50 lb. paper bags)	ton	22.85 /23.05
off color, domestic	ton	20.00 /25.00
white, imported	ton	29.00 /32.00
Blanc fixe, dry, precip.	lb.	.03½ .05
Calcene	ton	37.50 /45.00
Infusorial earth	lb.	.02 / .03
Kalite No. 1	ton	
No. 3	ton	
Magnesia, calcined, heavy	lb.	.04
Carbonate L.C.L.	lb.	.07 / .09
Pyrax	ton	
Whiting		
Columbia Filler	ton	9.00 /14.00
Domestic	100 lbs.	
Guilders	100 lbs.	
Hakuenka	lb.	
Paris white, English cliff-stone	100 lbs.	
Southwark Brand, Commercial	100 lbs.	
All other grades	100 lbs.	
Suprex, white extra light	ton	45.40 /60.00
heavy	ton	45.40 /60.00
Witco, c.l.	ton	7.00

Fillers for Pliability

P-33	lb.	
Thermax	lb.	
Velvetex	lb.	.03 / .04½

Finishes

IVCO lacquer, clear	gal.	2.15 / 2.50
colors	gal.	2.60 / 4.70
Rubber lacquer, clear	gal.	
colored	gal.	
Starch, corn, pwd.	100 lbs.	
potato	lb.	
Talc	ton	25.00 /45.00

Flock

Cotton flock, dark	lb.	.12 / .13
dyed	lb.	.50 / .85
white	lb.	.14½/ .20
Rayon flock, colored	lb.	1.25 / 2.00
white	lb.	1.00 / 1.25

Latex Compounding Ingredients

Accelerator 85	lb.	
89	lb.	
122	lb.	
552	lb.	
Alphasol-OS	lb.	.60
Antox, Dispersed	lb.	
Aquarex A	lb.	
D	lb.	
F	lb.	
Areskap No. 50	lb.	$0.20
No. 100, dry	lb.	.43
Aresket No. 240	lb.	.18
No. 250, alcoholic	lb.	.22
No. 300, dry	lb.	.46
Aresklene No. 375	lb.	.40
No. 400, dry	lb.	.56
Black No. 25, Dispersed	lb.	.22 /$0.40
Catalpo	ton	
Color Pastes, Dispersed	lb.	
Dispersex No. 15	lb.	.11 / .12
No. 20	lb.	.08 / .10
Emo, brown	lb.	.16
white	lb.	.16
Factice Compound, Dispersed	lb.	.40
Heliozone, Dispersed	lb.	
Igepon A	lb.	
MICRONEX, Colloidal	lb.	.06 / .07
Nekal BX (dry)	lb.	
Palmol	lb.	.10
Paradors	lb.	
R-23	lb.	.57
S.1 (400 lb. drums)	lb.	.65
Santomerse	lb.	.13
Stablex A	lb.	.90 / 1.10
B	lb.	.65 / .90
C	lb.	.40 / .50
Sulphur, Dispersed	lb.	.10 / .15
No. 2	lb.	
T.1. (400 lb. drums)	lb.	.40
Tepidone	lb.	
Vulcan Colors	lb.	
Zinc oxide, Colloidal	lb.	
Dispersed	lb	.12 / .15

Mineral Rubber

B. R. C. No. 20	lb.	.009 / .01
Black Diamond	ton	25.00
Genasco Hydrocarbon, granulated, (fact'y)	ton	
solid	ton	
Gilsonite Hydrocarbon (factory)	ton	
Hydrocarbon, hard	ton	
soft	ton	
Parmr Grade 1	ton	25.00
Grade 2	ton	25.00
Pioneer	ton	
265°	ton	

Mold Lubricants

Lubrex	lb.	.25 / .30
Mold Paste	lb.	.18
Sericite	ton	65.00 /75.00
Soapbark	lb.	
Soapstone	ton	25.00 /35.00

Oil Resistant

AXF	lb.	

Reclaiming Oils

B. R. V.	lb.	.03 / .0325
S. R. O.	lb.	.0175/ .0185

Reenforcers

Carbon Black		
Aerfloted Arrow Specification Black	lb.	.0535/ .0825
Arrow Compact Granulized Carbon Black	lb.	
"Certified" Heavy Compressed, Cabot	lb.	
Spheron	lb.	
Continental Dustless	lb.	.0445/ .0535
Compressed c.l.	lb.	.0445/ .0535
Uncompressed, c.l.	lb.	.0445/ .0535
Disperso, c.l.	lb.	.0445/ .0535
Dixie, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445
c.l., delivered New York	lb.	.0535
local stock, bags, delivered	lb.	.07½
Dixiedensed, c.l., f.o.b., New Orleans, La., Galveston or Houston, Tex.	lb.	$0.0445
c.l., delivered New York	lb.	.0535
local stock, bags, delivered	lb.	.07½
Dixiedensed 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445
c.l., delivered New York	lb.	.0535
local stock, bags, delivered	lb.	.07½
Excello, c.l., f.o.b. Gulf ports	lb.	.0445/ .0645
delivered New York	lb.	.0505/ .0705
l.c.l., delivered New York	lb.	.07 / .09
Fumonex, c.l., f.o.b. works	lb.	.03
ex-warehouse	lb.	.04½
Gastex	lb.	.03 / .07
Kosmobile, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445
c.l., delivered New York	lb.	.0535
local stock, bags, delivered	lb.	.07½
Kosmobile 66, c.l., f.o.b New Orleans, La., Galveston or Houston, Tex.	lb.	$0.0445
c.l., delivered New York	lb.	.0535
local stock, bags, delivered	lb.	.07½
Kosmos, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	lb.	.0445
c.l., delivered New York	lb.	.0535
local stock, bags, delivered	lb.	.07½
MICRONEX Beads, c.l., f.o.b. Gulf ports	lb.	.0445
c.l., delivered New York	lb.	.0535
local, stock, bags, delivered	lb.	.07½
Mark II, c.l., f.o.b. Gulf ports	lb.	.0445
c.l., delivered New York	lb.	.0535
local, stock, bags, delivered	lb.	.07½
Standard, c.l., f.o.b. Gulf ports	lb.	.0445
c.l., delivered New York	lb.	.0535
local, stock, bags, delivered	lb.	.07½
W-5, c.l., f.o.b., Gulf ports	lb.	.0445
c.l., delivered New York	lb.	.0535
local, stock, bags, delivered	lb.	.07½
W-6, c.l., f.o.b., Gulf ports	lb.	.0445
c.l., delivered New York	lb.	.0535
local, stock, bags, delivered	lb.	.07½
Pelletex	lb.	.03 /$0.07
Supreme, c.l., f.o.b. Gulf ports	lb.	.0445/ .0645
delivered New York	lb.	.0505/ .0705
l.c.l. delivered New York	lb.	.07 / .09
"WYEX BLACK"	lb.	
Carbonex	lb.	.029 / .0315
Carbonex "S"	lb.	.0315/ .034
Clays		
Aerfloted Paragon (bulk)	ton	6.50
Suprex No. 1 Selected	ton	10.00
No. 2 Standard	ton	9.00
China	ton	17.50 /20.00
Dixie	ton	
Junior	ton	
McNamee	ton	
Par	ton	
Witco, f.o.b. Works	ton	9.00
Cumar EX	lb.	.035

Reodorants

Amora A	lb.	
B	lb.	
C	lb.	
D	lb.	
Curodex 19	lb.	2.75
188	lb.	3.50
198	lb.	4.50
Paradors	lb.	
Rodo No. 0	lb.	
No. 10	lb.	

Rubber Substitutes

Black	lb.	.07¾/ .13½
Brown	lb.	.08½/ .14
White	lb.	.09½/ .15¼
Factice		
Amberex	lb.	.19
Brown	lb.	.09 / .16
Neophax A	lb.	.13
B	lb.	.13
Fac-Cel B	lb.	.18
C	lb.	.18
White	lb.	.10 / .17

Softeners

Burgundy pitch	lb.	.06
Cycline oil	gal.	.20
Industrial 90% benzol (tank car)	gal.	.16
Nevoil (tank car)	lb.	.019
Nuba Resinous pitch (drums) Grades No. 1 and No. 2	lb.	.03
Grade No. 3	lb.	.04
Palm oil (Witco), c.l.	lb.	.0575
Pine tar	gal.	
Plastogen	lb.	
Plastone	lb.	.30 / .35
R-17 Resin (drums)	lb.	.10
R-19 Resin (drums)	lb.	.10
R-21 Resin (drums)	lb.	.10
Reogen	lb.	
Rosin oil, compounded	gal.	.40
RPA No. 1	lb.	
No. 2	lb.	
Rubtack	lb.	.10
Tackol	lb.	.115
Powder	lb.	
Tonox	lb.	.16
Witco No. 20	gal	.20
X-1 Resinous oil (tank car)	lb.	.015

(Continued on page 92)

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	June 26	July 31	Aug. 7	Aug. 14	Aug. 21
July	12.26	....	....	....	....
Aug.	....	10.68	10.74	10.34	....
Sept.	12.25	10.73	10.79	10.39	9.69
Dec.	12.24	10.70	10.75	10.40	9.75
Mar.	12.31	10.84	10.84	10.52	9.90
June	....	10.90	10.84	10.59	10.01
July	....	10.92	10.84	10.62	10.03

New York Quotations

August 27, 1937

Drills		
38-inch 2.00-yard	yd.	$0.14½
40-inch 3.47-yard		.12⅛
50-inch 1.52-yard		.19¼
52-inch 1.85-yard		.16⅛
52-inch 1.90-yard		.15⅜
52-inch 2.20-yard		.13¾
52-inch 2.50-yard		.12⅞
59-inch 1.85-yard		.15¾
Ducks		
38-inch 2.00-yard D. F.	yd.	.14 /.14¾
40-inch 1.45-yard S. F.		.20¼
51½-inch 1.35-yard D. F.		.20¾
72-inch 1.05-yard D. F.		.28⅜
72-inch 17.21-ounce		.32¼
MECHANICALS		
Hose and belting	lb.	.28½
TENNIS		
52-inch 1.35-yard	yd.	.21½
Hollands		
GOLD SEAL AND EAGLE		
20-inch No. 72	yd.	.11
30-inch No. 72		.20
40-inch No. 72		.22
RED SEAL AND CARDINAL		
20-inch	yd.	.09⅝
30-inch		.18
40-inch		.19¼
50-inch		.27
Osnaburgs		
40-inch 2.34-yard	yd.	.12⅝
40-inch 2.48-yard		.11⅞
40-inch 2.56-yard		.09⅜
40-inch 3.00-yard		.09⅞
40-inch 7-ounce part waste		.08½
40-inch 10-ounce part waste		.12⅛
37-inch 2.42-yard		.12¼
Raincoat Fabrics		
COTTON		
Bombazine 60 x 64	yd.	.09½
Plaids 60 x 48		.11
Surface prints 60 x 64		.12
Print cloth, 38½-inch, 60 x 64		.06
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard	yd.	.09¾
64 x 68, 3.15-yard		.09¾
56 x 60, 3.60-yard		.08¼
44 x 40, 4.25-yard		.06
SHEETINGS, 36-INCH		
48 x 48, 5.00-yard	yd.	.05½
44 x 40, 6.15-yard		.04
Tire Fabrics		
BUILDER		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.35
CHAFER		
14 ounce 60" 20/8 ply Karded peeler	lb.	.33
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.32
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.34
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.32
23/5/3 Karded peeler, 1¼" cotton	lb.	.40
23/5/3 Combed Egyptian	lb.	.53¾
LENO BREAKER		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.35

THE accompanying table of week-end closing prices on the New York Cotton Exchange shows the week-end change of representative futures during August and closing prices for June 26 and July 31.

Spot middlings sold at 11.72¢ per pound on July 24. The price dropped steadily to a low of 10.96¢ on August 2 when it rallied for several days to reach 11.35¢ on August 5 but it fell off to 10.82¢ on August 9, after which there was a steady recession to a new low of 9.73 on August 26.

Sales at 15 southern markets totaled 315,005 bales during the past 26 days as compared with 174,752 bales for the same days in 1936. As in 1936 the daily volume of sales increased decidedly on August 12 and again on the 20th, these rises in general being sustained on the following days. This activity was probably due to the agitation for government loans. Average prices at 10 designated southern markets trailed the New York middlings prices at from .06¢ to .25¢ per pound.

Cotton prices dropped $2 a bale on August 9 when the government released the report estimating production from this season's United States crop at 15,593,000 bales of 500 pounds gross weight each. The government forecast a record yield of 223.3 pounds per acre. A season supply of American cotton of 21,711,000 bales is predicted which includes a carryover of 6,118,000 bales and the forecast figure. Total world supply of all cottons for the new season is estimated at the figure of 47,932,000 bales.

Further price declines at the end of the month were caused by rumors of a 9¢ per pound cotton loan by the government.

Fabrics

The cotton textile market has substantially improved since mid-July in the matter of orders for forward delivery laid down by converters, jobbers, and consumers. Orders are gradually coming into the market for fabrics for early consumption. Prices have been reduced materially in keeping with the sharply declining cotton market. It is anticipated that a trading level of value will be found soon and that fabric buying will be more pronounced.

The sheeting market has been very quiet, awaiting a settlement of the raw cotton market which is dependent on the action taken by the government on the cotton loan question.

Tire fabric quotations declined from 1¼¢ to 5¢ per pound. Holland cloth prices remained unchanged. Prices on raincoat fabrics dropped ¼¢ to ¾¢ per yard, and sheeting receded ½¢ to 1¼¢ per yard. The prices on drills, ducks, and osnaburgs fell off in amounts which ranged from ½¢ to 1⅞¢ per yard.

MIDWEST

(*Continued from page 74*)

a Workable Plan for Good Housekeeping? (b) What Are the Outstanding Fire Hazards? How Can They Be Minimized? (c) How Can Hand Tool Injuries Be Prevented? (d) What Types of Mill and Calender Safeties Are Most Satisfactory? Why? (e) What Protective Apparel Is Necessary for the Workers? (f) What Hazards Are Involved in Molding Small Rubber Parts? How Can They Be Overcome? (g) Other problems will be added as desired by those in attendance at the meeting.

Chicago Power Show

The Exposition of Power and Mechanical Engineering, to be held in the new International Amphitheatre, Chicago, Ill., from October 4 to 9, 1937, will include exhibits which will be of interest to the engineering staff of the various rubber manufacturing companies.

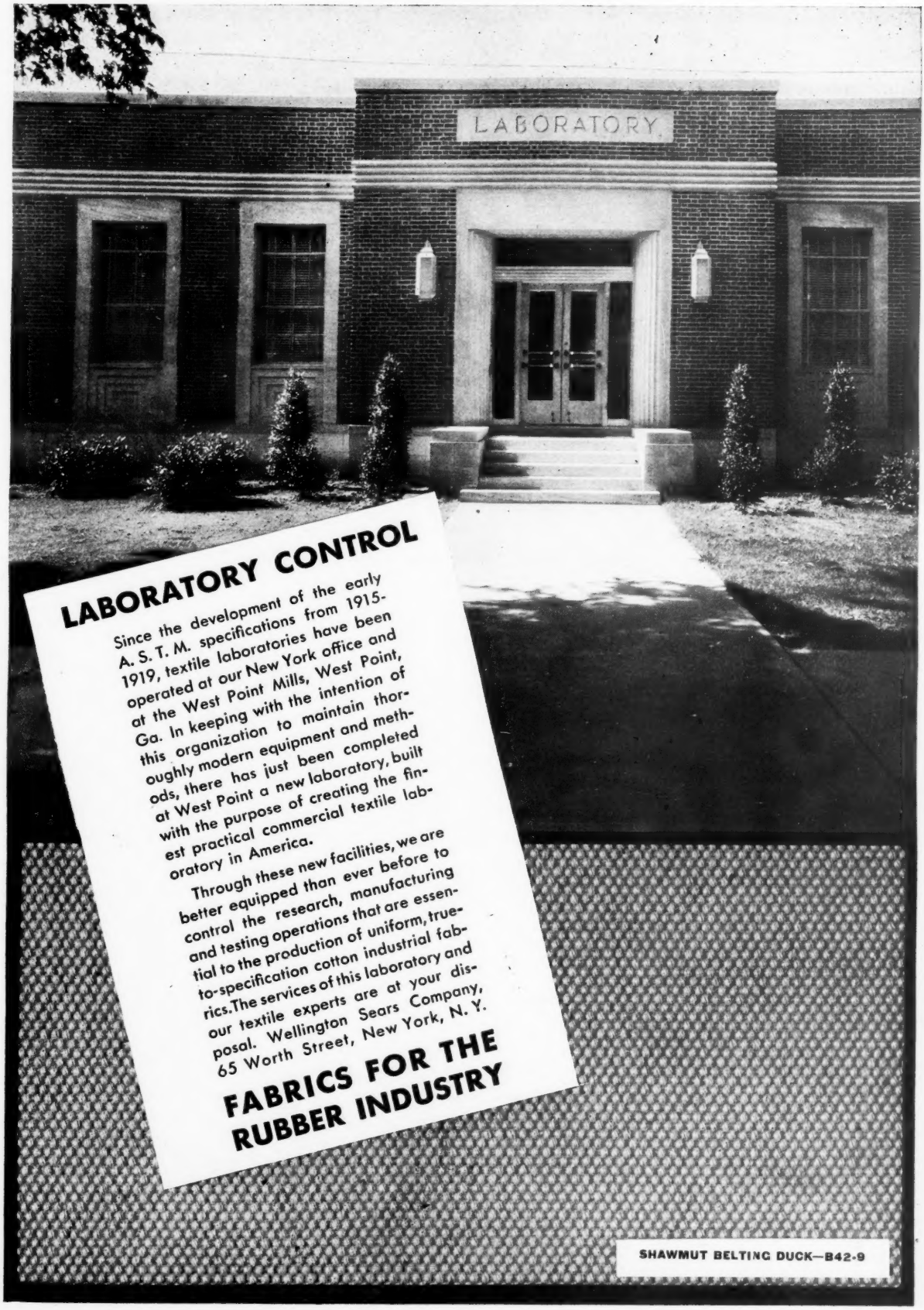
Of interest to all users of steam, compressed air, or other gases from which liquid must be removed when under pressure will be the displays devoted to the latest developments in steam traps. The traps, some of which have wearing parts entirely of stainless steel, will be designed to handle pressures from one pound to 1,500 pounds. The capacity of one line of traps ranges from 500 pounds to 240,000 pounds per hour. By means of glass enclosed operating models it will be possible to see the exact manner in which some of these traps operate in discharging condensate, air, and sludge.

Glucocide derivatives are being used for boiler scale and corrosion control. The exposition will show a complete range of chemicals for boiler water treatment and corrosion control.

Included in the operating exhibits at the Chicago Power Show will be bearings, drives, gears, couplings and speed controls.

Other features of technical interest in the transmission section will be exhibits of the most efficient means for absorbing starting torque and taking care of both angular and parallel misalinement. For silent operation in such applications as domestic heating, ventilating, and air conditioning, a rubber housed ball bearing pillow block is being introduced.

"Link-Belt Cast Iron Pulleys for Power Transmission." Link-Belt Co., Chicago, Ill. This 8-page list price book contains standard construction data for iron pulleys together with information for ordering them. Price lists are given for solid and split, single and multiple arm pulleys, with and without rubber lagging.


LABORATORY
LABORATORY CONTROL
Since the development of the early A. S. T. M. specifications from 1915-1919, textile laboratories have been operated at our New York office and at the West Point Mills, West Point, Ga. In keeping with the intention of this organization to maintain thoroughly modern equipment and methods, there has just been completed at West Point a new laboratory, built with the purpose of creating the finest practical commercial textile laboratory in America.
Through these new facilities, we are better equipped than ever before to control the research, manufacturing and testing operations that are essential to the production of uniform, true-to-specification cotton industrial fabrics. The services of this laboratory and our textile experts are at your disposal. Wellington Sears Company, 65 Worth Street, New York, N. Y.
FABRICS FOR THE RUBBER INDUSTRY
SHAWMUT BELTING DUCK—B42-9

Tire Production Statistics

	Pneumatic Casings—All Types		
	Inventory	Production	Total Shipments
1934	9,454,985	47,232,748	46,686,545
1935	8,195,863	49,361,781	50,183,129
1936	11,114,399	58,116,349	55,362,739
1937			
Jan.	11,377,015	4,980,174	4,509,240
Feb.	12,307,681	5,245,894	4,370,630
Mar.	12,448,167	5,915,575	5,787,051
Apr.	12,628,872	5,729,869	5,560,453
May	12,592,215	5,351,638	5,374,654
June	12,598,789	5,339,238	5,389,274

	Inner Tubes—All Types		
1934	9,179,893	46,227,807	45,045,495
1935	8,231,351	47,879,034	48,066,904
1936	10,985,273	57,247,554	54,624,321
1937			
Jan.	11,100,094	4,801,186	4,390,960
Feb.	11,733,525	5,090,504	4,536,354
Mar.	11,904,354	5,822,646	5,570,705
Apr.	12,218,374	5,626,849	5,325,486
May	12,106,849	4,955,948	5,028,364
June	11,745,722	4,716,044	5,026,963

	Industrial Pneumatic and Solid Truck, Tractor, and Trailer Tires		
	Inventory	Production	Total Shipments
1934	16,397	197,497	187,152
1935	20,315	283,606	275,741
1936	32,694	389,240	385,164
1937			
Jan.	47,020	37,979	40,421
Feb.	.....	42,716	40,924
Mar.	.....	49,138	47,210
Apr.	.....	49,549	46,856
May	.....	52,841	50,765
June	.....	48,139	48,967

	Solid and Cushions for Highway Transportation		
	Inventory	Production	Total Shipments
1934	13,574	*	*
1935	11,266	*	*
1936	8,908	*	*
1937			
Jan.	5,680	1,385	1,673
Feb.	....	1,507	1,472
Mar.	.....	1,544	1,812
Apr.	.....	1,560	1,981
May	.....	1,637	1,493
June	.....	1,603	1,834

	Cotton and Rubber Consumption, Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%) Gallons
	Cotton Fabric Pounds	Crude Rubber Pounds	
1934	196,069,495	697,558,218	17,063,298,000
1935	202,318,119	756,773,779	18,167,352,000
1936	199,546,100	754,301,443	20,242,782,000
1937			
Jan.	17,987,663	66,728,092	1,415,232,000
Feb.	18,975,305	67,185,852	1,344,000,000
Mar.	21,499,363	77,363,656	1,703,562,000
Apr.	19,990,810	75,258,546	1,823,178,000
May	18,847,111	68,857,256	1,910,328,000
June	18,656,792	68,771,088	2,040,360,000

Rubber Manufacturers Association, Inc., figures have been adjusted to represent 100% of the industry based on reports received which represent 97% for 1934-1935 and 81% for 1936-1937.

**Figures for years 1934, 1935, and 1936 included under Industrial Pneumatic and Solid Truck, Tractor, and Trailer Tires.*

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Trafalgar Sq., London, W.C.2, England, gives the following figures for July, 1937:

Rubber Exports: Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and other forms of Latex Tons
United Kingdom	8,070	308
United States	40,618	642
Continent of Europe	15,035	470
British possessions	4,723	28
Japan	2,144	22
Other countries	634	10
Totals	71,224	1,480

Rubber Imports: Actual, by Land and Sea

From	Dry Rubber Tons	Wet Rubber (Dry Weight) Tons
Sumatra	9,988	4,889
Dutch Borneo	3,238	804
Java and other Dutch islands	557	14
Sarawak	2,572	...
British Borneo	590	31
Burma	...	...
Siam	1,983	669
French Indo-China	357	188
Other countries	110	15
Totals	19,486	6,614

United States Latex Imports

Year	Pounds	Value
1934	29,276,134	$3,633,253
1935	30,358,748	3,782,222
1936	44,469,504	6,659,899
1937		
Jan.	2,995,027	535,546
Feb.	4,418,474	775,202
Mar.	4,962,915	968,053
Apr.	3,658,660	724,757
May	4,470,572	941,235
June	5,737,563	1,253,370

Data from Leather and Rubber Division, United States Department of Commerce, Washington, D. C.

New York Quotations

(Continued from page 88)

Softeners for Hard Rubber Compounding

Resin C Pitch 55° C. M.P.	*lb.*	.013 / .014
Resin C Pitch 70° C. M.P.	*lb.*	.013 / .014
Resin C Pitch 85° C. M.P.	*lb*	.013 / .014

Solvents

Beta-Trichlorethane	*gal.*	
Bondogen	*lb.*	
Carbon bisulphide	*lb.*	
tetrachloride	*lb.*	

Stabilizers for Cure

Laurex, ton lots	*lb.*	
Stearex B	*lb.*	.108 / .118
Beads	*lb.*	.108 / .118
Stearic acid, single pressed	*lb.*	.11½
Stearite	100 *lbs.*	10.80 /11.80
Zinc stearate	*lb.*	.23

Synthetic Rubber

Neoprene Latex Type 50	*lb.*	
53	*lb.*	
54	*lb.*	
Type E.	*lb.*	
"Thiokol" A (f.o.b. Yardville)	*lb.*	.35
Coating Materials	*gal.*	2.50 / 5.00
DX	*lb.*	.55
Molding Powder	*lb.*	.50 / .75

Tackifier

B. R. H. No. 2	*lb.*	.015 / .016

Varnish

Shoe	*gal.*	1.45

Vulcanizing Ingredients

Sulphur Chloride, drums	*lb.*	.03½/ .04
Rubber	100 *lb.*	2.00
Telloy	*lb.*	
Vandex	*lb.*	

(See also Colors—Antimony)

Waxes

Carnauba, No. 3 chalky	*lb.*	.35 / .36½
2 N.C.	*lb.*	.40 / .41
3 N.C.	*lb.*	.37½/ .38
1 Yellow	*lb.*	.46½/ .47
2	*lb.*	.45½/ .46
Montan, crude	*lb.*	.11. / .11½

A URUGUAYAN DECREE OF JUNE 26, 1937, made certain additions to the list of the sizes of tires for trucks, tractors, and omnibusses which are permitted conditional duty-free entry into Uruguay under the law of October 21, 1931, according to the Diario Oficial of July 3, 1937, Montevideo.

U. S. Crude and Waste Rubber Imports for 1937

	Plantations	Latex	Paras	Africans	Centrals	Manicoba and Guayule	Matto Grosso	Totals 1937	Totals 1936	Balata	Miscellaneous	Waste
Jan. *tons*	30,674	1,171	625	167	23	160	..	32,820	31,292	13	383	201
Feb.	40,326	2,100	717	15	2	129	..	43,289	35,219	37	1,300	217
Mar.	48,367	2,117	1,285	47	11	212	..	52,039	37,451	21	894	572
Apr.	35,117	1,684	754	79	17	190	..	35,850	40,365	6	283	99
May	48,196	1,809	612	46	2	175	..	50,840	35,600	44	669	868
June	45,680	2,678	318	70	22	188	..	48,956	41,802	47	641	374
July	36,315	2,154	140	75	11	413	..	39,108	35,847	44	726	307
Total 7 mos., 1937 *tons*	282,705	13,712	4,431	499	88	1,467	..	302,902	.....	202	4,896	2,638
Total 7 mos., 1936 *tons*	244,519	8,840	2,897	656	165	499	..	.....	257,576	642	5,042	1,349

Compiled from The Rubber Manufacturers Association, Inc., statistics.

World Net Imports of Crude Rubber

Year	U.S.A.	U.K.†	Australia	Belgium	Canada	Czechoslovakia	France	Germany	Italy	Japan	Russia	Rest of the World	Total
1934	439,100	213,300	9,600	9,100	28,400	11,000	50,400	59,300	21,400	69,900	47,300	60,500	964,500
1935	455,800	175,100	10,000	7,600	26,900	11,200	52,300	62,900	26,100	57,600	37,600	59,100	935,900
1936	475,361	62,676	14,423	9,627	27,867	8,772	56,777	71,793	16,534	61,701	30,967	64,647	831,684
1937													
Jan.	42,655	3,855	590	854	1,632	567	4,701	7,041	1,770	8,298	2,633	5,959	76,458
Feb.	44,398	6,081	331	1,363	1,271	837	5,276	7,911	1,502	6,605	3,048	5,068	77,388
Mar.	39,888	7,197	1,293	1,641	2,612	601	5,359	7,668	2,119	6,914	3,598	6,172	78,208
Apr.	42,066	9,871	1,058	1,069	1,343	1,445	5,302	8,664	1,669	5,808	1,532	5,843	79,607
May	48,506	8,488	1,287	2,113	4,187	925	5,530	6,706	2,771	8,597	1,886	5,358	93,966

†U.K. figures show gross imports, not net imports. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
Bold face type $1.25 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.00 per line (eight words)

Allow nine words for keyed address. *Replies forwarded without charge.*

SITUATIONS WANTED

PRODUCTION EXECUTIVE, WITH REAL PRACTICAL AND technical knowledge based on years of successful experience in soft and hard rubber mechanicals, automotive products of every description, also plastics. Age 47, available on short notice. Address Box No. 858, care of INDIA RUBBER WORLD.

EXECUTIVE, NOW EMPLOYED, DESIRES TO CONNECT WITH small company as general manager or superintendent. Thoroughly familiar with manufacture of all types of belting, packing, hose, flooring, soles and heels, rubber covered rolls, litho blankets, hard and soft rubber molded goods, druggists' sundries, and lathe-cut work. Competent to train inexperienced help and develop formulae. Best of references. Address Box No. 859, care of INDIA RUBBER WORLD.

EXPERIENCED COMPOUNDER AND CHEMIST DESIRES POSITION in compounding, factory control, or development work. Ten years' experience, including wide variety of rubber products. Would also be interested in position as superintendent of small plant. Address Box No. 860, care of INDIA RUBBER WORLD.

RUBBER TECHNOLOGIST: EIGHTEEN YEARS' EXPERIENCE covering compounding and manufacture of tires, tubes, bicycle tires, accessories, druggists' sundries, inflated toys, and mechanicals. Progressive and familiar with modern rubber compounding. Best of references. Immediately available. Address Box No. 864, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

RUBBER CHEMIST: NOT OVER 30 YEARS OF AGE, WITH experience in the manufacture of mold and dry heat cured rubber products. State age, education, detailed description of work done, and salary expected. All replies will be treated confidentially. Address Box No. 855, care of INDIA RUBBER WORLD.

WANTED: SALESMEN CALLING ON NEW ENGLAND RUBBER manufacturers to carry a side line. Address Box No. 861, care of INDIA RUBBER WORLD.

WANTED FOR MEXICO CITY: EXPERIENCED RUBBER CHEMist to take full charge of small plant specializing in rubberized fabrics, suede and molded goods. Thorough knowledge of compounding and economic production methods necessary. State fully experience, qualifications and salary expected. References. Apply: Banco Mercantil de Mexico, S. A., Apartado 634, Mexico, D. F., Mexico.

EXCELLENT POSITION OPEN FOR INDUSTRIAL ENGINEER. Must have had actual experience in the design and installation of machinery used in the production of all types of molded brake linings, as well as a working knowledge of compounds used. State qualifications fully as well as salary desired. Address Box No. 865, care of INDIA RUBBER WORLD.

(*Advertisements continued on page* 95)

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	May, 1937		Five Months Ended May, 1937	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	105,059,943	$22,163,440	474,031,264	$87,932,039
Liquid latex	4,470,572	941,235	20,505,648	3,944,793
Jelutong or pontianak	1,437,816	145,618	5,926,089	586,240
Balata	167,256	33,881	294,333	59,473
Gutta percha	158,857	35,730	974,959	188,354
Guayule	406,600	50,093	1,955,200	240,880
Siak	78,937	6,717	168,537	14,147
Scrap and reclaimed	1,637,094	49,797	5,722,935	170,532
Totals	113,417,075	$23,426,511	509,578,965	$93,136,458
Chicle, crude ...*Free*	877,184	$281,781	6,018,310	$1,756,623
MANUFACTURED—*Dutiable*				
Rubber tires ...*number*	10,657	$10,767	33,289	$59,848
Rubber boots, shoes, and overshoes ...*pairs*	470	62	15,859	8,072
Rubber soled footwear with fabric uppers ...*pairs*	37,859	9,400	390,741	105,284
Golf balls ...*number*	128,772	12,154	301,032	35,009
Lawn tennis balls...*number*	62,100	5,690	277,476	23,726
Other rubber balls...*number*	231,703	10,789	3,265,509	104,304
Other rubber toys, except balls	29,566	4,304	356,085	50,832
Hard rubber combs..*number*	72,906	4,562	353,816	21,554
Other manufactures of hard rubber	.....	2,199	.....	15,738
Friction or insulating tape..	28,700	1,835	87,800	4,967
Belts, hose, packing, and insulating material	.....	19,301	.....	80,740
Druggists' sundries of soft rubber	.....	5,022	.....	31,939
Inflatable swimming belts, floats, etc. ...*number*	88,769	6,928	797,088	52,764
Other rubber and gutta percha manufactures....*lb.*	136,197	33,290	718,261	154,409
Totals	.....	$126,303	.....	$749,186

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	1,283,169	$270,499	9,270,027	$1,818,795
Balata	53,488	16,542	398,750	116,604
Gutta percha, rubber substitutes, and scrap	118,238	23,946	441,972	96,175
Rubber manufactures	.....	1,199	.....	9,807
Totals	.....	$312,186	.....	$2,041,381

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,994,662	$93,232	10,602,111	$467,045
Scrap	13,798,123	287,268	34,850,158	663,938
Cements ...*gal.*	35,719	29,311	155,357	133,029
Rubberized automobile cloth, *sq. yd.*	55,518	26,964	265,217	120,429
Other rubberized piece goods and hospital sheeting..*sq. yd.*	176,877	79,230	828,140	354,686
Footwear				
Boots ...*pairs*	6,553	16,179	48,290	109,147
Shoes ...*pairs*	23,052	9,042	138,175	67,378
Canvas shoes with rubber soles ...*pairs*	60,481	35,613	188,567	102,680
Soles ...*doz. prs.*	3,690	6,420	18,239	32,629
Heels ...*doz. prs.*	65,681	40,098	300,557	167,791
Soling and top lift sheets..	78,272	14,128	283,501	51,050
Gloves and mittens..*doz. prs.*	7,434	17,815	37,549	81,528
Water bottles and fountain syringes ...*number*	23,800	8,621	98,910	35,242
Other druggists' sundries...	.....	45,631	.....	233,826
Gum rubber clothing....*doz.*	28,353	45,435	139,165	240,386
Balloons ...*gross*	39,825	26,960	179,266	133,710
Toys and balls	.....	14,471	.....	50,181
Bathing caps ...*doz.*	4,730	8,061	29,437	49,318
Bands	27,731	12,004	126,998	50,183
Erasers	47,129	24,499	167,044	95,910
Hard rubber goods				
Electrical battery boxes	39,422	24,601	150,851	72,549
Other electrical.....*lb.*	55,211	11,291	215,900	50,247
Combs, finished ....*doz.*	16,536	10,292	50,549	32,481
Other hard rubber goods..	.....	21,180	.....	106,889
Tires				
Truck and bus casings, *number*	17,040	330,240	76,393	1,485,465
Other automobile casings, *number*	69,952	737,668	352,096	3,736,597
Tubes, auto .....*number*	56,509	81,432	276,671	411,131
Other casings and tubes, *number*	6,513	61,376	29,702	229,860
Solid tires for automobiles and motor trucks..*number*	399	10,650	1,768	48,023
Other solid tires	90,125	15,545	539,302	75,696
Tire sundries and repair materials	.....	84,747	.....	359,743
Rubber and friction tape..*lb.*	81,802	24,433	365,945	93,645
Fan belts for automobiles.*lb.*	57,751	36,285	286,947	161,353
Other rubber and balata belts ...*lb.*	287,162	151,766	1,332,743	669,556
Garden hose ...*lb.*	81,561	15,194	460,846	93,193
Other hose and tubing...*lb.*	449,768	167,009	2,235,035	830,417
Packing	163,204	73,644	767,429	339,986
Mats, matting, flooring, and tiling	125,011	18,854	518,389	79,266
Thread	94,982	48,597	439,046	199,511
Gutta percha manufactures..	63,426	20,725	516,716	145,531
Other rubber manufactures..	.....	122,280	.....	589,590
Totals	.....	$2,908,791	.....	$13,050,815

Rubber Goods Production Statistics

TIRES AND TUBES*	1937 May	1936 May
Pneumatic casings		
Production ...*thousands*	5,352	4,971
Shipments, total ...*thousands*	5,375	5,832
Domestic ...*thousands*	5,281	5,752
Stocks, end of month...*thousands*	12,592	8,176
Inner tubes		
Production ...*thousands*	4,956	4,819
Shipments, total ...*thousands*	5,028	4,919
Domestic ...*thousands*	4,959	4,853
Stocks, end of month...*thousands*	12,107	8,719
Raw material consumed		
Fabrics ...*thous. of lbs.*	23,268	21,110
MISCELLANEOUS PRODUCTS		
Single and double texture proofed fabrics		
Production ...*thous of yds.*	3,991	3,268
Rubber and canvas footwear		
Production, total ...*thous. of prs.*	6,734	5,227
Tennis ...*thous. of prs.*	3,635	2,058
Waterproof ...*thous. of prs.*	3,098	3,170
Shipments, total ...*thous. of prs.*	4,784	4,429
Tennis ...*thous. of prs.*	3,778	3,333
Waterproof ...*thous. of prs.*	1,006	1,096
Shipments, domestic, total...*thous. of prs.*	4,735	4,399
Tennis ...*thous. of prs.*	3,736	3,309
Waterproof ...*thous. of prs.*	999	1,090
Stocks, total, end of month...*thous. of prs.*	21,116	17,497
Tennis ...*thous. of prs.*	5,071	5,289
Waterproof ...*thous. of prs.*	16,045	12,208

*Data for January to July, 1935, are estimated to represent approximately 97% of the industry; for August, September, October, November, and December, 1935, the coverage is estimated to be 81%.

Source: *Survey of Current Business,* Bureau of Foreign & Domestic Commerce, Washington, D. C.

Imports by Customs Districts

	June, 1937 *Crude Rubber		June, 1936 *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	11,307,066	$2,460,829	4,156,464	$633,466
New York	80,778,359	17,213,564	64,879,021	9,770,961
Philadelphia	4,124,364	904,676	1,484,137	256,121
Maryland	3,094,042	695,298	2,740,818	420,330
Georgia	.....	.....	84,191	13,050
Mobile	1,732,283	397,253	22,400	3,542
New Orleans	934,224	243,284	1,907,966	290,409
Los Angeles	8,[illegible]549	1,709,282	9,522,969	1,202,214
San Francisco	524,322	117,511	810,844	111,106
Oregon	22,400	4,704	.....	.....
Michigan	992	193	.....	.....
Ohio	412,606	88,924	116,020	13,185
Colorado	112,000	18,338	224,000	34,939
Totals	111,506,207	$23,852,856	85,948,830	$12,749,323

*Crude rubber including latex dry rubber content.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

NO.	COMMODITY	CITY AND COUNTRY
†3,645	Rubber coated steel sheets	Vienna, Austria
*3,648	Druggists' sundries	Lima, Peru
*3,673	Garters and suspenders	London, England
‡3,674	Corsets	London, England
†3,722	Balloons	Port Limon, Costa Rica
*3,748	Surgical Appliances	Curacao, Netherland West Indies
‡3,750	Carbon black	Hawthorn, Australia
*3,763	Carbon black	Warsaw, Poland
*3,806	Reclaimed rubber and purified or crude rubber	Warsaw, Poland
*3,814	Heels and soles	Johannesburg, South Africa
†3,837	Rubber soled shoes and rubber heels manufacturing machinery	Caracas, Venezuela

*Agency. †Purchase. ‡Purchase and agency.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	INQUIRY
2343	Manufacturer of two-quart capacity rubber jars.
2344	Supplier of raw materials used in making prophylactic rubber goods.
2345	Manufacturer of sponge rubber gym mats.
2346	Supplier of "Plastaid," a softener.
2347	Supplier of Acbar (or Akbar) rubber compound.
2348	Supplier of rubber-like product made from treated cashew oil.
2349	Manufacturer of marking ink able to withstand repeated sterilization for latex surgical gloves.
2350	Supplier of tire retreading equipment.
2351	Supplier of rubber for wheels and other baby carriage accessories.
2352	Manufacturer of decalcomania labeling paper impressed with rubber ink for printing the brand on belting, etc.
2353	Manufacturer of a small vulcanizing press to mold small rubber characters.
2354	Manufacturer of thin balloons to be inflated with hydrogen.

Classified Advertisements

Continued

MACHINERY AND SUPPLIES FOR SALE

FOR DISPOSAL: FOUR DOUBLE TIER (CARTER) 48 SPINDLE hose braiding machines. Address Box No. 857, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES WANTED

WANTED TO BUY: GOOD USED OR REBUILT LABORATORY mixer, laboratory vulcanizing press, laboratory calender, steam coal boiler, vulcanizing kettle. Address Box No. 862, care of INDIA RUBBER WORLD.

WANTED: FOR OUR EXPANSION PROGRAM, GOOD USED equipment including Experimental Machines, Large Size Mills and Calenders, Tubers, Hydraulic Presses and a Banbury Mixer, etc. Advise us of your offerings. Address Box No. 863, care of INDIA RUBBER WORLD.

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